

PRESIDENT then called on the HONORARY SECRETARY to read the following Paper, by Mr. SANDFORD FLEMING, C.M.G., who had suddenly been summoned to Canada on official business :—

CANADA; AND ITS VAST UNDEVELOPED INTERIOR.

Last session a distinguished gentleman, Dr. Donald Fraser, read an exceedingly interesting and instructive paper on Canada. It will probably be remembered that the learned gentleman alluded chiefly to what may now be termed old Canada, that is, the province or united province of Upper and Lower Canada as it existed some time ago, now the two provinces of Ontario and Quebec. It is not at all desirable that I should venture to take up any of your time with topics which have been so lucidly brought before you, and which have been already ably discussed. It is my purpose to begin where that gentleman left off, and endeavour to describe portions of the country which he did not prominently mention. I shall direct my observations to that part of the earth's surface extending from the Atlantic to the Pacific, and from the boundary of the United States to the Arctic Ocean, all of which is comprised within the limits of the Dominion. I shall refer chiefly to the undescribed territories of what may be called New Canada, and attempt to say something about that vast region, the greater part of which is as yet wholly unoccupied by human beings, but with respect to which my fellow colonists are said to be dreaming magnificent dreams.

First let me say a few words about the change which took place a few years ago when Canada dropped her provincial character and assumed semi-continental proportions. I shall not attempt to relate even in brief the political events which led to the confederation of the several British North American provinces. It is enough for the present to remark that local difficulties arose which in themselves seemed not easy of solution except in the adoption of measures similar to those now proposed for the Australian Colonies, which would widen the field and cause mere sectional interests to be of secondary importance. The importance of the objects to be attained seemed worth an effort, and, happily, decided steps were taken.

It has been the custom in the Old World on occasions when to some governing minds it seemed expedient to cultivate the love and affection of adjoining nations, to appeal to the forcible argument of gunpowder. If the object has been to civilise, or Christianise, or in any other way to benefit a people, in olden times it has not been uncommon to employ the sword. In Europe even to-day,

almost at the dawn of the twentieth century, in the laudable purpose of improving the condition of a portion of the human family, the blood of some 200,000 men has been spilled within a few months. War is still uppermost in men's thoughts; it is the one occupation full of life and energy, and all Europe is prepared or preparing for further scenes of destruction and desolation. In the New World Her Majesty's subjects of various races were privileged to form a sisterhood of provinces without the loss of blood; their schemes and aspirations most fortunately were discovered to be in harmony with Imperial policy, and under the gracious favour of the Queen they determined to make the attempt peacefully to weld the scattered provinces of British North America into one. If not peacefully they felt it should not be done at all, and perhaps the circumstances of the New World rendered easy what elsewhere would have been impossible. In the deep forests and the boundless prairies of Canada there is ample scope for all the energies of man. There, where every additional human life is a positive gain to the country, the combative, without destroying each other, may find vent for their fighting propensities in a life-long warfare against Nature in her wildest form.

Difficulties presented themselves to the idea of union. From geographical position, from distinct political organisation, and from limited business relations, the inhabitants of each separate province knew little of each other, and there had been an almost total absence of social intercourse. In view of a political union, an important step was to make the leaders in the local legislatures and the prominent men in the different isolated provinces acquainted with each other. Accordingly public and private hospitalities were tendered and accepted. Conferences were called for discussion, and festivities of every kind were engaged in. They began in the maritime province, where hundreds from the then province of Canada visiting, perhaps, for the first time, the sea-coast, were sumptuously entertained. Soon afterwards the towns on the St. Lawrence and the great inland lakes echoed back the kindly greetings which came from "those who lived down by the sea." In this peculiar way Canadians, true to the hospitable instincts of the British race, with the knife and fork in place of the sword and rifle, inaugurated a successful attempt to lay the foundation of the New Dominion.

A series of important events followed each other with startling rapidity, finally culminating in a scheme for consolidating in one government half a dozen distinct provinces, and providing for the political future of half a continent. The scheme was confirmed by

Imperial legislation, received the Royal sanction, and became the Constitution of Canada on the 1st July, 1867. All the eastern provinces were thereupon united in federal bonds, and four years later British Columbia and the vast territory once under the sway of the Hudson's Bay Company entered the union.

Having mentioned some of the events which ushered in the birth of the new Dominion, it will now be my purpose to furnish in a concise form a general account of the great region embraced within its limits, all of which is under the control of the Canadian Government. Preliminary thereto it seems proper that I should refer to some of those early discoverers and daring travellers who gave to the world the first knowledge of the country.

Last session, Mr. Fraser, when he addressed the Institute, referred to Sebastian Cabot, who touched the east coast of Labrador so long ago as 1496, and to Jacques Cartier who, in command of two or three French vessels, sailed up the St. Lawrence in 1534, and proceeded to establish trading ports, which proved to be the beginning of the old province of Canada, now Quebec. Attention being now directed to a more extended field, in fact, to the northern half of North America, our inquiries must necessarily take a wider range, and embrace discoveries on the Pacific, on the Arctic, as well as on the Atlantic coast.

In the fifteenth century, when the Continent of America was first discovered, the dimensions of the globe were but imperfectly known. Its circumference was thought to be much less than it has since proved to be, and the newly-discovered land was supposed to be the eastern shores of Asia. Spain and Portugal were then the great maritime powers of the world, and they agreed, under a Treaty of Partition founded on a bull issued by Pope Alexander VI. in the year 1494, that the Spaniards should possess exclusive control over the western route to Asia, while the Portuguese should communicate through eastern channels. The question of jurisdiction having thus been settled and stamped with the authority of the highest power in those days, the Portuguese pursued their discoveries to the east by way of the Cape of Good Hope, while the Spaniards endeavoured to find their way, in a westerly direction, through new seas and unknown lands, to India. The Spanish ships cruised along the Atlantic coast of America in the hope of finding their way to the south of Asia. In 1513 the Isthmus of Darien was crossed, and in three years afterwards Spanish navigators penetrated the Straits of Magellan ; and thus the Pacific Ocean was discovered at two widely separate points.

In 1592, Juan de Fuca is reported to have followed the Mexican

and Californian coasts until he reached the broad inlet of the sea which to this day bears his name, and which forms the southern limit of Canada on the western ocean. Eight years after the alleged discovery by Juan de Fuca, Henry Hudson ascertained the existence of a great inland sea accessible from the Atlantic side of the new continent. From Hudson's Bay it was confidently expected that some passage would speedily be found which would enable ships to traverse from the Atlantic to the Pacific and shorten the voyage from Europe to Asia.

In 1669 the whole region surrounding Hudson's Bay was granted by the British Crown to the society of merchants ever since known as the Hudson's Bay Company, who, after thoroughly exploring its shores, failed in discovering an outlet to the west.

The first civilised men who pierced the interior were probably French adventurers and traders from old Canada, while the whole country was yet in the possession of France. The exploits of these men who, without the slightest previous knowledge of the territory, penetrated among numerous savage tribes, would be of thrilling interest. They passed from the St. Lawrence through the great lakes Huron and Superior, and by the innumerable intricacies of streams, lakes, and portages to Lake Winnipeg. Thence they passed up the River Saskatchewan to about the 103° meridian, where they planted their most distant trading post some 2,000 miles from the then colonised parts of Canada.

In 1679, almost two centuries ago, Robert Chevalier de la Sale entertained the idea of finding a way to China through the lakes and rivers of Canada. His expedition set out in the frail canoes of the natives, his point of departure above the rapids on the St. Lawrence, near Montreal, was named, and is still named, La Chine, in consequence of the daring project to reach from that point the land of the Chinaman. Half a century later the attempt was renewed. In 1731, Pierre Gauthier de Varennes, under the auspices of Charles, Marquis de Beauharnois, Governor of New France, commanded the expedition, and although he failed to reach the Pacific Ocean, he was the first to reach the Rocky Mountains.

In 1762, Fort La Rouge, close to the site of the present Fort Garry, was an established trading post. Soon after this the conquest of Canada extinguished French possession and terminated French exploration in the western wilderness. Even the French missionaries, who were the first to preach the Gospel to the aborigines, abandoned the country, and did not resume the work for nearly sixty years.

A hundred years after the grant to the Hudson's Bay Company, one of their agents, Mr. Samuel Hearne, was commissioned to examine the interior. Between 1769 and 1772, that early explorer made journeys on foot and in canoes 1,000 miles westerly from the place of his departure on Hudson's Bay. He discovered Great Slave Lake and other large lakes, and traced the Coppermine River to its mouth.

Exactly a hundred years ago, and in the year before the sad end of one of the most distinguished navigators and discoverers, Captain Cook touched at Nootka Sound, on the western coast of Vancouver's Island, claimed its discovery, and remaining there a few weeks he sailed along the coast to Behring Straits.

After an intermission of eleven years, Alexander Mackenzie, in the service of the North West Fur Trading Company, set out on an important exploration of the interior. Between 1789 and 1793, that intrepid traveller discovered the great river which justly bears his name, and followed it to the Arctic Ocean. He ascended the Peace River to its source, was the first civilised man to penetrate the Rocky Mountains, and pass through to the Pacific Coast. This traveller inscribed in large characters on a rock by the side of Dean Inlet, "Alexander Mackenzie, from Canada by land 22nd July, 1793." On the same day that Mackenzie painted that memorable inscription by the side of the Pacific, Captain Vancouver was pursuing his examination of the coast about two degrees further north. A short time before Mackenzie emerged from the interior, Vancouver had visited the spot where Mackenzie slept but one night within sound of the sea. Thus these two distinguished travellers, from opposite directions and engaged in totally different pursuits, discovered precisely the same place, and, by a remarkable coincidence, all but met each other.

In 1806, Simon Fraser crossed the Rocky Mountains from Canada, and descended the great river of British Columbia which in his honor was named after him. It was my good fortune many years ago to read Fraser's original manuscript journal, then in the hands of his son. I have since witnessed the foaming rapids and boiling whirlpools of that wildest of all large rivers, and I cannot be surprised that not many have attempted, and still fewer have succeeded, in following in the wake of Simon Fraser from its source to its mouth. Twenty-two years afterwards, however, Governor Sir George Simpson made the daring attempt. In 1828 he stepped into a canoe at York Factory on Hudson's Bay, and stepped out of the frail craft some time afterwards at the mouth of the River Fraser, having in the interim traversed the interior, and carried

the canoe, as Mackenzie did before him, from the source of Peace River to the great northern bend of the Fraser.

This celebrated traveller, in his journey round the world in 1841, again crossed the northern half of America. His course was by the St. Lawrence, the Ottawa, Lakes Nippising, Huron, Superior, and by the canoe route to Lake Winnipeg. Then across the prairie *via* the Saskatchewan to the Rocky Mountains and by Kootenais to the Columbia River.

In June, 1843, Captain (now General Sir Henry) Lefroy arrived at Red River, passed through to Lake Athabasca, and then remained from the middle of October to the end of February following, engaged in meteorological and magnetical observations. In March, 1844, he started for Fort Simpson on Mackenzie River, where for several months his time was occupied in similar pursuits.

The north-west passage, a problem which had already baffled the energy and skill of navigators, remained unsolved at the beginning of the present century, and a series of attempts were made to throw light on the gloom which surrounded it. Some of those efforts assumed the forms of expeditions by land, traversing the region which now constitutes part of Central Canada, and therefore call for further notice. The reference to them must be brief, but the indomitable perseverance and heroic endurance which they developed and displayed, demands a passing tribute to names which will be familiar in Canadian and Arctic story.

In 1819, an Arctic land expedition was organised under the command of Captain Franklin. That officer travelled, *via* Red River, to Cumberland House on the Saskatchewan, and thence by Fort Chipewyan, Fort Enterprise, and the Coppermine River, to the Arctic Coast. This expedition was marked by frightful suffering and loss of life.

In 1825, Franklin started on a second expedition. Having reached Ontario, he passed, *via* Lakes Huron and Superior, to Red River, and thence traversed the country to Great Bear Lake, where he wintered. The following year he pursued his journey to the Arctic coast, *via* Mackenzie River.

In 1833, Captain Back, on an expedition in search of Sir John Ross, passed from Montreal to Lake Winnipeg and thence to Fort Reliance, where he wintered; after which he followed the Great Fish River to the Arctic coast.

In 1836, Messrs. P. W. Dease and Thomas Simpson, at the instance of the Hudson Bay Company, started overland from Red River on a joint expedition. They spent the years 1837, 1838, and 1839 in explorations on the northern coast. They joined the sur

veys of Franklin and Beechey at Point Barrow in Behring Strait, and those of Franklin and Back between the Coppermine and Great Fish Rivers, making the longest boat voyage in the Arctic seas on record.

In 1845, Dr. Rae took his departure from Lake Superior on the breaking-up of the winter, passed by the common route to Red River, by Lake Winnipeg to Norway House and thence to York Factory, where he wintered. A year afterwards he wintered at Repulse Bay without fuel, and subsisted with his party for twelve months on food obtained with the gun and spear. He united the surveys of Ross and Parry, a distance of about 700 miles, and made the first long sledge journey performed in that part of the world, the total distance being nearly 1,300 miles.

In 1848, Sir John Richardson, who had already made two overland journeys with Sir John Franklin, made a third in search of that lamented traveller. On the last occasion he was accompanied by Dr. Rae. The two volumes published by Richardson on his return afford evidence of the minute scientific observations made in that part of Canada traversed by these celebrated explorers, and afford ample proof of the value of their labours.

In 1849, Dr. Rae, alone, passed down the Coppermine River, pursuing the object of discovering Franklin with unabated vigour.

In the following year Dr. Rae renewed the search. He wintered at Fort Confidence, Great Bear Lake; descended the Coppermine River; travelled over ice nearly 1,100 miles, at an average rate of from twenty-five to twenty-six miles a day; and made the fastest long Arctic journey which has ever been known. Subsequently, on the same expedition, he made a boat voyage almost rivalling that previously made by Dease and Simpson.

In 1853 and 1854 this indefatigable and justly celebrated traveller, Dr. Rae, was again in the field. Again we find him wintering at Repulse Bay, living nearly altogether on the produce of the gun, the hook, or the spear. He made another sledge journey of over a thousand miles, and joined the surveys of Dease and Simpson with those of Ross west of Boothia. On this occasion Dr. Rae was so far successful as to set at rest all doubts as to the sad fate of the Franklin expedition. For this the promised reward, £10,000 sterling, was presented to him and his men.

With the exception of a final exploration made in 1855 by Messrs. Anderson and Stewart, who passed down the Great Fish River, this ends the record of the overland Arctic expeditions. It cannot be denied that, notwithstanding all the toils, perils, and privations inseparable from them, these expeditions have resulted

in loss and disappointment in the main object for which they were undertaken, viz. a north-west passage for ships. They have incidentally, however, given valuable additions to our knowledge of the country and made important contributions to science.

These various overland Arctic expeditions, of which I have presented but an outline, extended over a period of thirty-six years. But for them the northern regions of Canada would not have been so thoroughly explored. We have now a fair knowledge of the northern coasts, with all their silent and peaceful grandeur, far away from the feverish bustle of busy men. The more Arctic portions of the Dominion are probably destined to remain for ever undisturbed by the hum of industry, and continue, as Providence has hitherto kept them, with all the characteristics of snow and solitude which mark the landscape in high latitudes.

While investigations were being proceeded with during a series of years in the northern parts of British North America, in connection with the all but futile attempts to find a north-west passage between the Atlantic and Pacific oceans, it was not until a comparatively recent period that special attention was directed to the southern and far more valuable portions of the country.

Between the years 1819 and 1855 the northern districts were traversed in many directions. It was only subsequent to the latter date that regularly organised efforts were made to gain information respecting the country nearer home.

In 1857, on the recommendation of the Royal Geographical Society, Her Majesty's Government sent out an expedition to explore the country between Lake Superior and the Rocky Mountains. It was placed under the command of Captain Palliser, who, with a staff of scientific men, remained pursuing his investigations until 1859. Reports of the highest value were published on the return of the Expedition.

The Government of the late province of Canada likewise sent out an expedition in 1857. Its object was to survey the canoe route between Lake Superior and the Red River settlement. Messrs. Dawson and Hind, who were in charge of distinct branches of this expedition, pursued their investigations during 1857 and 1858, extending them as far west as the south branch of the River Saskatchewan.

In the same years, 1857 and 1858, Captain Blakiston, at the instance of the Royal Society, was engaged in meteorological and other scientific observations. He began at York Factory, on Hudson's Bay, passed inland to Lake Winnipeg, and thence by the Saskatchewan to the Rocky Mountains.

Other travellers, who were not directly commissioned by the Imperial or Colonial Governments, passed through the country, and on their return added valuable contributions to the general stock of information. In 1859 and 1860 the Earl of Southesk followed the Assineboine and Saskatchewan valleys to the Rocky Mountains, and some years afterwards gave the public the benefit of his observations. In 1862 and 1863, Lord Milton and Dr. Cheadle crossed from the Atlantic to the Pacific by the Yellow Head Pass and Thompson River, performing a journey in which they were exposed to perils and narrowly escaped disaster. The volume, "The North-West Passage by Land," published on their return to England, is one of the most charming among modern books of travel. In 1864 we again find Dr. Rae at work. On this occasion he had abandoned the Arctic regions in favour of a more southern journey. He crossed, as Milton and Cheadle did in the previous years, *via* the Saskatchewan, to Tete Jaune Cache, but, unlike them, he turned at this point to follow the Fraser in place of the River Thompson, finally reaching the Pacific coast.

I ought not to omit to mention Messrs. Douglas and Drummond, both botanists, who spent some time in the country, and David Thompson, after whom the River Thompson is named. He was for many years in the service of the Hudson's Bay Company as astronomical surveyor. To his labours we are indebted to no small extent for our geographical knowledge of much of the interior.

I should do injustice to the missionaries who have gone forth at different times to Christianise and civilise the native tribes, did I overlook the part they have taken in throwing light on the physical features of the several regions they have visited. Ministers of the Anglican, Wesleyan, Presbyterian, and Roman Churches have each and all done their part. To French clergymen of the last-named Church we are perhaps chiefly indebted. Nearly a hundred and fifty years ago Pierre Arnaud, on his first intercourse with the Indians, fell a victim, together with one of the brothers Verandrye and party on their way between Lake Superior and Red River. Canada owes much also to the learned Archbishop Taché, whose travels during a sojourn of over thirty years have been extensive, and the results of whose observations in many parts of the far interior have been given to the world.

This brings the list of the principal explorers, as far as I have been able to learn who they were, and the record of the various independent discoveries which have been made, up to the period when the whole territory formerly known as British North America came under the name and jurisdiction of Canada. As I before

mentioned, the Imperial Act by which British Columbia and the Hudson Bay territory entered the Dominion, came into force in July, 1871. On that day strong engineering parties were sent out by the Government of Canada to explore the whole region intervening between the seat of Government at Ottawa in the eastern provinces and the Pacific coast at the west. The object was to obtain more complete information respecting the country, and form a line to be followed by a trans-continental railway. The engineering force engaged in this work has been about a thousand men of all grades. The surveys have been continued from 1871 up to the present time. I have been intimately connected with it myself, and therefore it behoves me to refrain from saying much with respect to the manner in which the work has been done. I may, however, be pardoned for alluding to the earnestness and determination of the Government and people of Canada with respect to the development as rapidly as possible of the magnificent country which has come under their control. An instance may be given in connection with the surveys. After three years had been spent by the large staff in exploring every part of a wild, uninhabited, and roadless country, extending a distance of about three thousand miles, a great amount of exact engineering information had been obtained at a heavy cost, when a serious and discouraging disaster occurred. In 1874, in mid-winter, the building in which were deposited the field note-books, the unfinished plans, and nearly all the other information accumulated, was destroyed by fire, and nearly every scrap of paper was consumed; and thus the labour of three years, and results which had been obtained at a cost of about £300,000 sterling were lost. Nothing daunted, the order was given to begin the work of surveying afresh. It has been vigorously prosecuted up to the present time, and now I can point to some of the results as being highly satisfactory.

I shall not attempt to weary you with even an outline of the details of the work which already fills volumes; I will simply allude presently to the general information which has been acquired, and perhaps some of the more important results which have been obtained. It will, however, enable the members of the Institute to form some idea of the labour which has been expended on this survey when I inform them that the total length of explorations made during the last seven years exceeds 47,000 miles, and that no less than 12,000 miles have been laboriously measured by chain and spirit level, yard by yard, through mountain, prairie, and forest. To mention that the Canadian Government has on this special examination alone expended about £700,000 sterling will

not fully convey a correct idea of the energy and determination displayed.

Besides extensive land surveys in Manitoba, the boundary line between Canada and the United States has been defined from end to end. This was done by a joint Commission appointed by both countries. The British section of the commission was in command of Major D. R. Cameron; the work occupied three years, and after it was finished the reports furnished, including scientific papers, by Captains Anderson, Featherstonhaugh, and George M. Dawson, have largely extended our knowledge of that portion of the country adjoining the southern boundary line from the Lake of the Woods to the Rocky Mountains. A boundary survey west of the mountains had been previously effected.

The foregoing sketch of the early discoveries of different independent portions of North America, which together make up the Dominion of Canada, and the reference to the various explorations and surveys which from time to time have been made in different parts, will enable members of the Institute to judge of the value of the information, geographical and physical, which has been acquired respecting much of the country. The several provinces on the Atlantic sea-board, and the valley of the St. Lawrence, are well known, and have already been described at a former meeting. The southern margin of the country, extending from these provinces westerly to the mountains, has been examined with the greatest care by the Royal Commission appointed to define the boundary between Canada and the United States. The Canadian coast on the Pacific, with its many deep fiords, flanked in some instances by mountains reaching the limits of perpetual snow, has been the subject of repeated explorations. The northern side of the country, with its long summer day and its equally long winter night, has been visited in nearly every part by brave indefatigable men, who, after perils and privations of no ordinary kind, have mapped it out, and left it again to the silence and desolation which pervades the Arctic circle. The interior is so vast that it cannot be said to have been completely examined. There are still some districts where the foot of civilised man has not yet stepped, but, as I have shown, explorers have been in many directions, adventurous men have penetrated the gloomy recesses of the primeval forest, have peered into the rocky fastnesses of the mountains, and, with unflagging toil and unflinching endurance, have gained for us a general and reasonably correct knowledge of much of the country.

I shall not venture to weary you with many details, but shall en

deavour only to lay before you a very brief and condensed description of the general physical characteristics of the several great divisions of the territory comprised within the limits of the Dominion. In the first place, it is important that a perfectly clear and correct conception should be formed of its extent. If we open an ordinary atlas and overlook the parallels of latitude and longitude, for the moment, all countries appear very much about the same size. Scales and projections are adopted to suit the convenience or fancy of the publisher. Large countries are made small and small countries are made large, to suit the size of the book, and thus strange misconceptions are often formed. If, however, we take a large terrestrial globe upon which all the land and water on the earth's surface are depicted on precisely the same scale, our ideas will be corrected. If on the surface of the globe we draw on one sheet of tracing paper the outlines of Canada, and on another the outlines of Europe, and then proceed to lay the one over the other so as to cover as much of the land in each case as possible, and if we go on to measure and make allowance for portions left uncovered, we shall find that Europe somewhat exceeds the area of Canada, but that the excess is not great. Lest it be imagined that Canada has an undue share of the region of ice and snow, we may exclude from the comparison all the land within the Arctic circle in both cases, and still we find that Canada covers fully more of the earth's surface than the comprised areas of European Russia, Lapland, Norway, Sweden, Denmark, Holland, Belgium, the British Islands, France, Spain, Germany, Austria, and all the principalities between the Adriatic and Black Seas; in fact, if we leave out Spain and Italy, Canada appears to equal in area the remainder of Europe.

Of course, this is a comparison simply of extent; it has no reference to soil, or mineral resources, or to climate. These features will be briefly considered presently.

It has been found convenient in describing the general characteristics of Canada to divide it into three great regions. Its leading botanical, geological, and topographical features suggest this division. One region, except where cleared of its timber by artificial means, is densely wooded, another is wooded and mountainous, the third is a vast lowland plain of a prairie character. The Mountain Region is on the western side; the Prairie Region is in the middle; the remainder, which embraces the settled provinces on the St. Lawrence, originally covered with a growth of timber, may, for the sake of simplicity of description, be considered the Woodland Region.

I shall first consider the Prairie Region. If we place before us

an orographical map of North America, it will be noticed that a great continental plain stretches north and south between the Gulf of Mexico and the Arctic Ocean. It is bounded on the western side throughout its whole extent by the Rocky Mountain zone, and on the eastern side in part by a less elevated region, the Appalachian zone. This great plain occupies the whole of the continent of North America between the western and eastern mountain ranges. It is divided by its river systems into three perfectly distant drainage basins. One drains to the south into the Gulf of Mexico, another north into sub-Arctic waters, and the third east into the Atlantic by the channel of the great river St. Lawrence.

Of these three basins, that of the St. Lawrence is by far the smallest, and the northern is fully as large as the other two together. The St. Lawrence basin, on the boundary between the United States and Canada, occupies part of both countries; the southern basin is almost wholly in the United States; the northern basin is almost wholly in Canada; and the line of contact between the two latter basins is in part approximately coincident with the 49th parallel of latitude—the southern limit of the interior of Canada. It will thus be seen that the great continental plain of North America is divided naturally, as well as artificially, through the centre. It is divided politically into two adjacent countries, under distinct governments, and naturally into three vast drainage basins, the smallest of which occupies a comparatively narrow strip along the eastern portion of the international boundary line, while the other two discharge their waters in diametrically opposite directions.

The Prairie Region of Canada lies in the northern drainage basin: it may be considered to extend from south to north, more than a thousand miles, and nearly the same distance from east to west. It is not all a treeless prairie: a considerable portion is thinly wooded, yet the whole is considered as more or less partaking of a prairie character.

The Prairie Region, so called, is somewhat triangular in form. One side coincides with the international boundary line, and extends from the 95th to the 118th meridian; another side follows the eastern side of the Rocky Mountains from the 49th to about the 64th parallel of latitude. The third side about 1,500 miles in length, skirts a remarkable series of lakes, rivalling in size Lakes Erie and Ontario. These great water-filled depressions lie in a generally straight north-westerly and south-easterly direction. They embrace Great Slave Lake, Lake Athabasca, Lake Wollaston, Deer Lake,

and Lake of the Woods, and they appear to occur geologically on the separating line between a broad band of laurentian or metamorphic rocks and the softer silurian formations. This great triangular-shaped region is estimated to measure about 800,000,000 acres. Its base, running along the series of lakes, mentioned will probably average less than 1,000 feet above the sea, and its apex, near where the international boundary line enters the Rocky Mountains, will probably be about 4,000 feet above sea level. This region may generally be described as a great plane sloping from its apex in a north-easterly direction downwards to its base, but the inclination is not uniform and unbroken. Several terraces and well-defined escarpments stretching across the country are met with at intervals. A great proportion of the surface is gently rolling, and hills of no great height occur here and there. The rivers of this division of the country flow for a great part of their course in deeply eroded channels, frequently of considerable width, and as the superficial formations are for the most part drift or soft rock, the channels which have been furrowed out are but little obstructed by falls or steep rapids. They generally present a uniform descent, and the long stretches of some of the rivers, although the current be swift, are capable of being navigated. A wide expanse of the region to the south of the main Saskatchewan is a prairie, without trees or shrubs of any sort; the tree-less prairie passes by easy gradations into copse wood land with prairie intervening. To the north of the Saskatchewan, woodland appears in various localities. On Peace River there are extensive prairies; there is, also, an agreeable mixture of woodland and prairie, and this character of country appears to prevail for a considerable distance still further north.

It is scarcely to be supposed that a region so extensive would be found all fertile land. The great American desert, which covers a wide area in the centre of the United States, was at one time thought to extend north for a considerable distance into Canada. The Boundary Commission reports, however, appear to show that the arid and unproductive tract is more limited in the Canadian side than was previously supposed, and that a great breadth of the country previously considered valueless may be used for pastoral purposes, and some of it ultimately brought under cultivation. There are other places within the territory described as the Prairie Region which are unfavourable for farming pursuits; and although certain drawbacks claim recognition, there can no longer be any doubt respecting the salubrity of the climate and the existence of vast plains of rare fertility. Information on this head has

been obtained year by year. Professor Macoun, a well-known botanist, has recently been commissioned specially to investigate this subject. He estimates that there are no less than 160,000,000 acres of land available in this region alone for farming and grazing purposes, of which one-half, or 80,000,000 acres, may be considered fit for cultivation.

The mineral riches of this great division of Canada are but imperfectly known. It has, however, been established that immense deposits of coal exist in many parts, chiefly along the western side. The examinations of Mr. Selwyn, director of the Geological Survey, carry the impression that the coal-bearing rocks pass with their associated coal seams and iron ores beneath the clays farther east, and it may be that shafts would reveal workable seams of coal at such limited depths beneath the surface as would render them available for fuel and for industrial purposes in the heart of the prairies. Should these views of Mr. Selwyn prove correct, it will be of the greatest possible importance to the country. Besides coal and iron ore, petroleum, salt and gold have also been found.

The nucleus of a population has for many years existed on the Red River : it was originally formed by the Earl of Selkirk near the beginning of the present century. In the autumn of 1812 he reached the chosen locality, Kildonan *via* Hudson's Bay and Nelson River, with a small party of Highland Scotchmen. Subsequently the numbers were increased, and a number of French Canadians also settled down to cultivate the soil at St. Boniface, on the opposite bank of the Red River. The Red River settlers, exposed to many vicissitudes during a space of half a century, did not greatly prosper. But since the incorporation with Canada of the whole country] formerly under the sway of the Hudson Bay Company, marvellous progress has been made. The province of Manitoba has been created around the place which was once the Selkirk settlement ; the population has increased from a mere handful to many thousands, and it has to all appearance entered on a career of unexampled progress.

Manitoba, although a province with prospects so brilliant, occupies but a small corner of the fertile lands in the interior of Canada. The Prairie Region, as set forth in the foregoing, is alone ten times the area of England, reckoning every description of land : such being the case it may be no vain dream to imagine that in due time many Provinces will be carved out of it, and that many millions of the human family may find happy and prosperous homes on these rich alluvial plains of Canada.

I shall now pass to that other great division of the country which has been designated the Mountain Region.

This is part of the great elevated mountain zone of North America, which begins in the Cordilleras and elevated plateaus of Mexico and extends to the Arctic Ocean. If we examine the orographical map, it will be observed that the Rocky Mountain zone, although it has many subsidiary mountain ranges, is characterised for the greater part of its length by two prominent and perfectly distinct Alpine chains, each with many spurs or branches. One of these main chains is directly along the Pacific coast: in Canada it is known as the Cascade Mountains, and farther south as the Sierra Nevadas. The other is in the Rocky Mountains proper: it observes a general, although not perfect, parallelism with the coast. The distance between the crests of these two lofty chains varies from 1,000 miles in the United States to 300 miles in Canada, and from this circumstance may be attributed the remarkable widening of the alluvial plains in the Canadian half of North America.

I shall now confine my remarks to that portion of the Rocky Mountain Zone within the limits of Canada.

The Cascade Chain rises abruptly from the sea level, presenting from the water an extremely bold and defiant aspect. The average height of the many serrated summits will probably range from 5,000 to 8,000 feet above sea level, and some of its central crests and loftiest peaks rival in elevation the main Rocky Mountain Chain. The main Rocky Mountain Chain is in Canada from 300 to 400 miles distant from the Pacific coast. This chain rises like a colossal wall above the continental plain on its eastern side. Its flanks are, however, deeply gashed, and great counterfort-like spurs jut out, between which the rivers which water the Prairie Region take their rise. Much of this great mountain barrier rises over 8,000 feet above sea level. The loftiest central peaks enter the region of perpetual snow; some of them, indeed, reach an elevation estimated at 15,000 feet above the ocean. On the western flank of the chain are several independent groups of mountain, known by local names. They are separated from each other by narrow valleys and deep chasms, some of which are prolonged in the direction of the Prairie Region, forming passes through the mountains. Some of these passes are from 6,000 to 7,000 feet above the sea, and they range down to less than 2,000 feet. These transverse openings through the lofty chain afford comparatively easy passages from one side to the other. The lowest and most remarkable is in about latitude 56 degrees. Here the Peace River

rises on the western side of the Rocky Mountain, and flows through them at a low altitude, ultimately passing into the Mackenzie River.

Between the Cascade and Rocky Mountain Chains there extends an elevated plateau, averaging from 3,000 to 4,000 feet above sea-level. This plateau is grooved out by deep river channels, broken by rocky ridges and inferior mountain masses. It has many lakes, occupying deep depressions in the surface, and is intersected in many directions by numerous broad, sheltered, undulating valleys. The surface of this plateau in some quarters is thickly, in others scantily, timbered, and in some districts open prairies present themselves.

Off the shore of the mainland there are several large islands, the most important of which is Vancouver Island; the others are the Queen Charlotte group. The former is half as large as Scotland, the latter is in area more like Wales. The climate of these islands is moist and temperate, and in this respect they are not dissimilar to the British Islands. Vancouver, the most southerly, has an elevated interior with mountains rivalling in height those of the mother-country. Some of the central peaks, such as the Alexandra, the Albert Edward, and the Victoria, rise from 6,400 to 7,500 feet above the sea. The last, the Victoria Peak, is double the height of Snowdon, and one-third higher than Ben Nevis.

Besides Vancouver and the Queen Charlotte group, there exists along the shore of the mainland an archipelago of smaller islands, between which are deep, and in many places intricate passages. Great arms of the sea pierce the mainland in many places. They resemble the deep-water, rock-bound fiords of Norway, and they penetrate so far that the largest iron-clads afloat could steam, in some cases, to the very heart of the Cascade Mountains.

The Mountain Region has some good lands, but the fertile tracts are limited in extent; when developed they will be advantageously situated for raising agricultural products and stock to supply the mining industries which in time will undoubtedly be established.

This region is exceedingly rich in minerals; it contains coal and iron in profusion. In quality the Vancouver coals are found superior for steam-engines to any worked on the Pacific coast. They find their way to California, and are used on the railways leading out of San Francisco, in spite of a high duty imposed by the United States. The precious metals are also found. The yield of the gold washings is already about 40,000,000 dollars, and within the past year quartz mining has been inaugurated. Mr.

Dawson, of the Geological Survey, reports: "I think it may be said without exaggeration that there is scarcely a stream of any importance in the province of British Columbia in which the 'colour' of gold is not found." Silver is met in several localities. Copper, mercury, lead, platinum, and nickel are also mentioned in the reports of the Geological Survey.

Very much still requires to be learned respecting the rock formation of the Mountain Region. Data have, however, been collected in a rapid and necessarily imperfect geological exploration sufficient to establish the existence of great mineral wealth. There can be no doubt that here we have a wide and promising field, and the future will witness industries of various kinds working and developing the riches which lie buried under the surface. The forests, of enormous growth, which exist in many places, and the fisheries of the rivers and coasts, will give employment to a very considerable population.

I must now turn to the Woodland Region, but to describe it even in outline would far exceed the limit of this paper; I must therefore content myself with a few passing remarks. I have already defined the Woodland Region to be the whole of Canada not within the Mountain Region in the west and the Prairie Region in the middle; it therefore embraces all the settled portions of the eastern provinces which were wooded at one time, but have within a brief period in part been cleared by the hand of man. This Region is of immense extent; it embraces 84 degrees of longitude; its most southerly point is on Lake Erie, in the 42nd parallel, and stretches from the latitude of Rome away far north to a point at least 200 miles within the Arctic circle. Compared with the country on the Pacific coast, no part of this region can be considered mountainous. Although elevated ranges, like the Laurentides, are met, only a small proportion of the country exceeds 2,000 feet above sea-level. An area of fully 200,000 square miles is estimated to be under 500 feet.

So great an extent of territory presents many varieties. In the north it assumes an Arctic character, and resembles portions of Siberia. The nearest portion of Canada to Europe is that which is least known and believed to be least valuable. It is bounded on the west by Hudson's Bay, and on the east by the Atlantic Ocean. Its extreme length from north to south is about 1,000 miles, and about the same length from east to west. This section of Canada is somewhat greater in area than Norway and Sweden, Denmark and Lapland, and a great extent of it is considered to have no better climate than the northern parts of these European countries.

To the north-west of Hudson's Bay about an equal area may be similarly described. Its surface is varied, and its vegetation affords sustenance for the great herds of reindeer and musk ox which find a home in this otherwise inhospitable section. It presents no prospect for the agriculturist; the only hope is in the fisheries along the coast, in the fur trade, and possibly in minerals which lie hidden under the surface.

These are the worst sections of the country; as we advance southward its character gradually changes and improves. True there is a broad band, the agricultural resources of which are not promising; but the forests which cover the surface will every year become more and more valuable, and its geological structure affords indications of mineral wealth. The investigations of the Geological Survey here point to the existence of rich deposits extending over wide areas. The more important minerals are gold, silver, iron, copper, lead, phosphates, and plumbago. Crossing the metalliferous band, we reach considerable tracts of land which by cultivation will produce all the ordinary crops; and continuing south we finally reach Ontario, one of the finest wheat-producing provinces in the world.

I must say a word about the climate. It should be borne in mind that Canada, like Europe, extends over so many degrees of latitude that it must have many gradations of climate. In some parts of Canada fruits ripen in the open air that cannot successfully be grown in England in any quantity except under glass. In one locality every farmer enjoys the luxury of a large peach orchard, while far to the north the flora and fauna are those of Lapland, and still farther north icebergs are the perennial crop. The alpine region bordering the Pacific, as in Southern Europe, presents lofty peaks reaching the permanent snow-line, while at lower levels in the vicinity of the ocean a climate soft and mild as Ireland prevails.

In the greater part of Canada, however, the thermometer has a wide range. In summer the temperature runs high; in winter it occasionally goes very low. It is difficult for a resident of this country to understand how one can live and enjoy life in a temperature sometimes many degrees below zero; but owing to the extreme dryness of the atmosphere the cold is not really felt so much as might be imagined. Ordinary work is carried on in the open air without inconvenience in what would seem to a resident in England very great degrees of cold. Ploughing, as a rule, is never done; the land lies completely dormant during the winter months; but various other kinds of work are performed. The construction of the public works, such as canals and railways, goes on,

and in this portion of the year, thousands of men proceed to the pine forests to cut logs for exportation and for the local saw-mills. As a further illustration of what can be done in a climate which, when mere temperature is considered, would seem an unendurable one, I may mention that the explorations for the Pacific Railway have been carried on in winter as well as summer for several consecutive years. Most persons in London would no doubt consider it a hardship to sleep a single winter night on Hampstead Heath with, say, but an inch of snow under them. The climate of Canada admits of exposure, with proper precautions, which would be thought inadmissible in England. The Pacific Railway staff were engaged in explorations thousands of miles from ordinary human habitations, and had only canvas for shelter winter and summer. I could name men who for two consecutive years have been continuously in the field, and who during that period had no roof other than the tent over them. And I must explain that these men were not, as might be supposed, the hardy Orkneyman or Highlander in the service of the Hudson's Bay Company—a race of men inured to tempest and storm, who for generations have been employed in the remote north of America, and who, as pioneers, have left their names on the rivers and mountains of the country. Nor were the men I refer to all native-born Canadians, accustomed to the climate from childhood. Some of them were tenderly brought up in the mildest counties of the British Islands, and those men appeared to endure the low temperature to which they were day and night for months exposed with as little inconvenience as those who had been more accustomed to it. These facts will probably tend to correct some notions respecting the much-dreaded cold. It is well known that the human system is not affected by temperature alone in the same way as a thermometer. My own experience of a third of a century in Canada enables me to judge of this. In the performance of my duties I have been exposed to the inclemency of the weather more than many men, and while I confess to have suffered from the summer heat of Canada, I am not sensible of having felt cold more keenly than I have felt it at times in the British Islands. In saying this I am perfectly aware that thermometric tables establish beyond dispute that the winter temperature of Canada ranges far below that of England.

Generally speaking, the climate of habitable Canada may not unfairly be compared with that of Russia, Germany, Austria, and other countries in Europe. It cannot be denied that the winters are perhaps longer and colder than desirable. The climate is certainly continental, but notwithstanding the wide range of

temperature, there cannot be a doubt that it is not only endurable, but is healthy and salubrious.

Viewing Canada as one consolidated country, extending across the widest and not the least valuable portion of the continent of America, embracing a marvellous breadth of fertile and unoccupied land, with a healthy, invigorating climate ; with illimitable mineral resources ; with supplies of timber in her forests second to those of no country in the world ; with inexhaustible fisheries in its great lakes and rivers, and around its coast on three oceans ; with deposits of coal and iron of unmeasured extent in the interior of the country, and on the Atlantic as well as on the Pacific sea-boards ; taking all these natural elements of future wealth and greatness into consideration, the problem which presents itself is, the development of a country which has been provided with natural resources so lavishly. The question is, how to colonise the northern half of North America, and render it the home of a happy and vigorous people. It is true that Canada already has a population of some four millions, but as yet the mere outer fringe of the country is occupied. We are only beginning to realise the fact that the interior has space for many times the present population. It is just beginning to dawn upon Canadians themselves that in the territories which have been described, there is room, and to spare, and there exist the elements of support, for a greater population than the mother-country. No wonder, then, that the problem to be solved appears one of weighty importance.

The waterways of a country present the natural means of colonisation. In bygone times, rivers and lakes, the shores of bays and estuaries, have been followed by adventurous races, and these natural channels have thus in all ages furnished the means of spreading the human family. Canada is not wanting in highways of this kind, although many of them are subject to drawbacks which will presently be referred to. On the eastern side she has the Gulf of St. Lawrence, which in many respects resembles the Baltic. To the north she has Hudson's Bay, a sheet almost half as large as the Mediterranean. She has lakes, but they are really seas, and they breed storms and tempests like the Atlantic. I might attempt to describe a dozen of these inland freshwater seas, but I should fail to convey a correct idea of their character and importance. Fortunately I can refer to a description of the waterways of Canada by a master-hand. I cannot, I am sure, quote higher authority than that great traveller and distinguished nobleman, the Governor-General. On a recent occasion, Lord Dufferin, standing as near as possible midway between the Atlantic and the

Pacific, and addressing some of the subjects of Her Majesty in the province of Manitoba, said :—

“To an Englishman or a Frenchman, the Severn or the Thames, the Seine or the Rhone, would appear considerable streams; but in the Ottawa, a mere affluent of the St. Lawrence, an affluent, moreover, which reaches the parent stream 600 miles from its mouth, we have a river nearly 550 miles long, and three or four times as big as any of them. But, even after having ascended the St. Lawrence itself to Lake Ontario, and pursued it across Lake Huron, the Niagara, the St. Clair, and Lake Superior to Thunder Bay, a distance of 1,500 miles, where are we? In the estimation of the person who has made the journey, at the end of all things, but to us who know better, scarcely at the commencement of the great fluvial systems of the Dominion, for from that spot, that is to say from Thunder Bay, we are enabled at once to ship our astonished traveller on to the Kaministiquia, a river of some hundred miles long. Thence almost in a straight line we launch him on to Lake Shebandowan, and Rainy Lake and River—the proper name of which, by the by, is ‘Rene,’ after the man who discovered it—a magnificent stream 300 yards broad, and a couple of hundred miles long, down whose tranquil bosom he floats into the Lake of the Woods, where he finds himself on a sheet of water which, though diminutive as compared with the inland seas he has left behind him, will probably be found sufficiently extensive to render him fearfully seasick during his passage across it. For the last eighty miles of his voyage, however, he will be consoled by sailing through a succession of land-locked channels, the beauty of whose scenery, while it resembles, certainly excels the far-famed Thousand Islands of the St. Lawrence. From this lacustrine paradise of sylvan beauty we are able at once to transfer our friend to the Winnipeg, a river the existence of which in the very heart and centre of the continent is in itself one of Nature’s most delightful miracles, so beautiful and varied are its islands, so broad, so deep, so fervid is the volume of its waters, the extent of their lake-like expansions, and the tremendous power of their rapids. At last, let us suppose we have landed our traveller at the town of Winnipeg—the half-way house of the continent, the capital of the Prairie Province, and, I trust, the future ‘umbilicus’ of the Dominion. Having had so much of water, having now reached the home of the buffalo, like the extenuated Falstaff, he naturally ‘babbles of green fields,’ and careers in imagination over the primeval grasses of the prairie. Not at all. Escorted by Mr. Mayor and the Town Council, we take him down to your quay, and ask him which he will ascend first, the Red River or the Assiniboine, two streams—the one 500 miles long, the other 480—which so happily mingle their waters within your city limits. After having given him a preliminary canter upon these respective rivers, we take him off to Lake Winnipeg, an inland sea 300 miles long and upwards of sixty broad, during the navigation of which for many a weary hour he will find himself out of sight of land, and probably a good deal more indisposed than ever he was on the Lake of the Woods, or even the Atlantic. At the north-west angle of Lake Winnipeg he hits upon

the mouth of the Saskatchewan, the gateway and high road to the North-West, and the starting point to another 1,500 miles of navigable water, flowing nearly due east and west between its alluvial banks. Having now reached the foot of the Rocky Mountains, our 'Ancient Mariner'—for by this time he will be quite entitled to such an appellation—knowing that water cannot run up hill, feels certain his aquatic experiences are concluded. He was never more mistaken. We immediately launch him upon the Athabaska and Mackenzie Rivers, and start him on a longer trip than he has yet undertaken, the navigation of the Mackenzie River alone exceeding 2,500 miles. If he survives this last experience, we wind up his peregrinations by a concluding voyage of 1,400 miles down the Fraser River, or, if he prefers it, the Thompson River to Victoria, in Vancouver, whence, having previously provided him with a first-class return ticket for that purpose, he will probably prefer getting home *via* the Canadian Pacific. Now, in this enumeration, those who are acquainted with the country are aware that, for the sake of brevity, I have omitted thousands of miles of other lakes and rivers which water various regions of the North-West—the Qu'Appelle River, Belly River, Lake Manitoba, the Winnipegosis, Shoal Lake, &c. along which I might have dragged and finally exterminated our way-worn guest, but the sketch I have given is more than sufficient for my purpose; and when it is further remembered that the most of these streams flow for their entire length through alluvial plains of the richest description, where year after year wheat can be raised without manure or any sensible diminution in its yield, and where the soil everywhere presents the appearance of a highly-cultivated suburban kitchen garden in England, enough has been said to display the agricultural riches of the territories I have referred to, and the capabilities they possess of affording happy and prosperous homes to millions of the human race."

Lord Dufferin did not allude to the artificial waterways of Canada. Compared with some of the lakes and rivers, the canals are, indeed, unimportant; but they will stand comparison with any works of their class. As engineering achievements, I believe I am correct in saying that they are unrivalled. They are certainly as much superior to the canals of the United States, as the latter are in advance of anything I have seen in England. These canals exist only in the provinces which lie in the valley of St. Lawrence, still they are of immense value as links in a great chain of navigation, on which during part of the year the products of field and forest are floated to market. But however valuable the artificial, as well as the natural waterways of Canada are, they are open to one serious drawback. They are, as may be supposed, exposed to climatic influences, and the low temperature I have referred to, however dry and invigorating to man, has the effect in the still brilliant nights of early winter, of sealing them up until the sun again begins to return to the summer solstice.

The early settlement of the provinces was effected by means of the rivers, and bays, and lakes. There were no railways in those days: the hardy pioneers, axe in hand, landed on the forest-clad banks, and cut out homes for themselves and their children. In the four or five winter months they became completely isolated from the outer world, and from all but their nearest neighbours. In consequence the progress of settlement was but slow, and it was confined mainly to a narrow margin of land along the navigable water channels. It was not until railways were introduced that the progress of the provinces was so marked. These lines of communication, performing their functions independently of climate, connecting all parts of the old settlement, and penetrating wide tracts of land not previously accessible, have given Canada an enormous impulse, and established the conviction that the great interior to be prosperous, if colonised at all, must eventually be traversed not simply by one railway, but by many railways. The great water-ways will do their part during the open season in assisting to colonise the vast unoccupied regions that are fitted for the homes of men, but they alone would be utterly insufficient. If existing railways have proved so advantageous to sections of the country provided with navigable water channels, and at no great distance from the ocean, such as the settled portions of the province of Ontario, railways become indispensable to the western fertile regions not so favourably situated. In the great internal cultivable territory, therefore, it is clear that a system of railways must be considered necessary, in order to provide for its occupation by the many millions it is capable of supporting.

We have already had some experience of railways in Canada, as their construction has been progressing for the past twenty-five or thirty years, and we have found it important to regard with attention the principles which should govern their establishment in new districts. I shall not enter into mistakes which have undoubtedly been committed in the past, by which a great deal of money, public and private, has been sunk and wasted; but in the remarks which follow, it will be observed that due regard is had to the experience gained in these matters, and to the importance of avoiding such fatal mistakes as the building of lines which would injuriously compete with each other, or the sinking of money prematurely in the completion of any lines long before they are wanted.

In carrying railways through unsettled regions, we are called upon to solve a problem differing in essential circumstances from that which has to be considered in laying down lines in old districts already well populated. In the latter case the work is designed

practically to diminish distance by the use of high speeds. A heavy expenditure to attain high speed is justifiable, as traffic already exists which will immediately render expenditure productive of revenue. In an unoccupied country, the circumstances are entirely different. Traffic, without which there can be no revenue, has to be created, and the question is complicated by the consideration that the railway itself is indirectly the chief means by which traffic is expected in process of time to be developed. There is a marked difference in the necessities of the two cases. In the inhabited country the railway is an after-thought, and high speed is the prime necessity which calls the line into being. In the unoccupied country a certain means of communication is of first importance, and if high speed cannot be obtained without involving an outlay that would prove burdensome, those concerned must for a time be contented with a less perfect, low speed line until the population becomes sufficiently numerous and wealthy to call for high speed. Such being the case, it seems wise to keep in view from the very first three important considerations:—

1. Certainty of communication at all seasons.
2. The expenditure of no more unproductive capital than may be absolutely necessary.
3. The necessity of a high-class railway ultimately, and the importance of securing it without any waste or misapplication of capital in carrying into execution preliminary or intermediate works.

By a high-class railway in the third consideration, must be understood a line so perfect that not only high speed may be attained with safety and certainty, but that the actual cost of conveying passengers, as well as products of all kinds, would be reduced to as low rates as it would be possible to make them. I may say that I have no faith in what are sometimes erroneously called cheap railways. The true cheap railway is the one that can with profit do its work cheaply. I would advocate the utmost economy in expenditure, but at the same time the kind of perfection referred to should be kept prominently in view from the very first.

The Pacific Railway has been projected for the double purpose of connecting the Atlantic and Pacific sides of Canada, and the opening up of the interior for settlement. This project has been the subject of much discussion in Canada; it has entered into the realm of politics, and opposite parties, although agreeing with respect to the great desirability of the line, have not agreed as to the means of securing it. As an individual simply, I may hold views that do not harmonise with those of either party, or of any person, but I shall nevertheless, from an individual and perfectly

independent standpoint, endeavour briefly to lay my views before you.

The whole country between the settlements in the Ottawa valley and the coast of British Columbia has as yet very few civilised inhabitants. There are, according to various estimates, probably from 8,000 to 12,000 souls in occupation of portions of British Columbia, and within the past few years settlers have begun to pour into the Pacific region in the province of Manitoba. There are also a few hundreds established on the north shore of Lake Superior. Taken altogether, there are probably not more than 20,000 or 30,000 within a very considerable distance of any part of the 3,000 miles of railway which has been projected. It is perfectly evident, therefore, that the construction of the Canadian Pacific Railway, in the present condition of the country, is a very serious undertaking, and requires grave consideration. I have no doubt whatever that it will at no distant day be a work accomplished, that it will form not only a connecting link between the old half-dozen provinces on the Atlantic, and the still greater number of provinces which have yet to come into existence in the west; but that it will constitute an important part of a great Imperial highway extending between the heart of the Empire in England and some of its outlying portions and dependencies on and beyond the Pacific.

The Pacific Railway being projected for a double purpose, it may not be without profit to consider the purposes and to view it, firstly, as a colonisation line, secondly as, a through national line.

Firstly. The experience which we have gained in Canada has tended to establish several sound economical principles in connection with the building of colonisation railways in new territories. Some years ago, a scheme based on these principles was projected, which commended itself to my judgment, and which, in part at least, has since been sanctioned by the Government. It was termed the Territorial Road Scheme, and as it may possibly be capable of application with advantage to other countries such as those Colonies where much land yet remains to be occupied, it may not be without interest to members of the Institute. I shall venture, therefore, briefly to notice it.

First of all it is assumed that railways will ultimately be required and built in every district where the natural resources of the country, although for the present dormant, are capable by the application of human industry, of producing traffic which would render steam power as a means of transit necessary and profitable. Supposing we have to colonise a territory fulfilling these conditions, the first step is to discover by elaborate surveys the very best position

for the future railway system which the prospects or possibilities of the country would seem to demand. The system of lines thus to be projected may consist of a single trunk line with branches at proper intervals, or it may be a number of lines running in the direction which traffic would seek, or on which in the public interest it would be desirable to lead it. It is considered important to take this step in advance of settlement, because even a few settlers frequently acquire considerable influence in a new country, and, as is sometimes the case, they may succeed in warping or twisting a trunk line away from the most advantageous position to another and inferior position, in order to suit their adventitious and purely local circumstances. Thus, general interests which, in the future may be of the greatest importance, may suffer through comparatively insignificant local interests unduly magnified for the moment. Having determined the lines upon which the railways some time or other are to be built, the next step is to select at proper intervals the most suitable points for the stations, and from these, and these only, to project all the branch roads of every class that are likely to be required.

Thus the road system of the country to be colonised is proposed to be projected and the position of the several lines definitively fixed, but as the line of railway in some instances may for many years be used as an ordinary road before it finally be converted into the steam communication, and as it could scarcely be designated a railway until it became one, the term "territorial road" was suggested. This term it was proposed to apply to all trunk lines destined ultimately to become railways.

Having established the position of the territorial roads and the points on them for future railway stations, the next step is to lay out at the latter points sites for villages and towns. Along the territorial road lines it is designed to erect a telegraph and to make in the first place a common cheap road, such as are usually made for the first requirements of settlers. It is also proposed as time rolls on to give employment to such of the poorer settlers as might require it, in improving the road, having in view always its ultimate purpose, and thus form the groundwork of the future railway by a series of progressive stages corresponding indeed with the progress of the settlement. It is designed that the line shall be used as a cart or waggon road in its rudimentary state, the rails to be laid and the railway to be completed only when the demands of traffic or the exigencies of the country require the steam communication.

The scheme undoubtedly has much to recommend it. Settlers

would know beforehand where the railway and road system of the country would be created, and they would govern themselves accordingly in selecting their locations. The trade of the country would grow up in the proper channels designed for it. There could be no railways built where they were not wanted, and they need not exist as railways until they are actually needed. Thus ruinous competition would be avoided, and accumulated losses or unproductive capital may be greatly reduced or altogether saved. Traffic would flow from the first centre at the future stations and, as a consequence, at these points, villages at first, important towns in time, would spring up. A concentration of labour year by year on the territorial road would give the pioneer settlers needful employment, would in course of time prepare it for the superstructure of the railway, while the occupation and cultivation of the land and the development of other natural resources would prepare the country for railway services.

This scheme for the development of the highways of a new country appears peculiarly applicable to the circumstances of the case under consideration, if we shut out from our view all questions except simply the colonisation of the interior of Canada. After the position of the lines have been determined on—and this should be done after exhaustive examinations have been made—the next effort should be to complete telegraphic communication along the precise line of the future railway. The cost of a telegraph is so trifling compared with its advantages, that it should be made the precursor of other means of communication. The telegraph erected, a bridle-path from post to post would probably be the first means of transport ; then would follow a waggon or post road ; finally, a perfect line of railway, when the traffic of the country or the interests of the nation required the most rapid means of steam communication.

The territorial road system was suggested at a period anterior to the agreement made with the Province of British Columbia, to build a continuous line of railway from one side of the continent to the other. If for the moment we view the trans-continental railway simply as a colonisation line, the economical principles of the scheme then advocated appear as applicable to-day as they were formerly. I shall, therefore, in order clearly to elucidate these advantages, take the liberty of reproducing one or two paragraphs which I penned at the time :—

“ The application of the principles laid down for opening up, by means of territorial roads, the leading highways of a new country, if applied to the development of the vacant districts in the interior of British North

America, would result in most important advantages. A territorial road is understood to be the precursor of a railway; its establishment is recommended in every case where prospective traffic may possibly render steam power, as a means of conveyance, profitable or necessary; and this is considered essentially one of these cases. If the building of a railway be at the present time inexpedient, who will venture to say, in view of the many millions of fertile acres stretching in a wide band across the central plains to the rich auriferous valleys of the Rocky Mountains, and in view of the sudden impulse which may be given to properly directed emigration and colonisation, that a railway will not follow in the path of a simple road across the continent before another generation has passed away? . . . If a portion of the immigration, which has hitherto swelled the ranks of the American Republic, could be led to our own prairies by a route which would make them as near and as accessible as those on the Mississippi, a post road and a telegraph through the country would meet with abundant employment; a demand would soon be created for an improved means of communication; and on some sections, railway service would speedily be called into requisition.

"By opening up a territorial road and erecting a line of telegraph across the country, steam and electricity, the great civilisers of the present century, would obtain a foothold on the wide, dreary, and as yet uncultivated wastes in the far interior; and although it might be said that the seeds only of the former would be sown, the latter would bear immediate fruit; time and labour would develop the former, while the latter would stimulate these agencies in their work. For many reasons it is thought that an electric telegraph ought to be erected along the precise line of the intended railway at the earliest possible moment; in addition to its value in a military and commercial aspect, as an instantaneous means of communication between the two oceans, it would aid greatly in the work of colonisation; it would enable points, isolated in other respects, to express their wants and wishes,—settlements springing into existence a hundred or a thousand miles distant, would always be aware of each other's progress, and be made acquainted with important events as they transpire; and thus the pioneer settler, although for a time remote from civilisation and its accessories, would at least feel less secluded by being within instantaneous hearing of them.

"It is part of the plan proposed that the territorial road should be constructed and improved from a rude beginning through gradual stages, in harmony with the progress of the country, to the highest degree of perfection required by traffic. It is thought that both the development of the road and the settlement of the country would in this way be much enhanced,—road work and settlement keeping pace with each other to the mutual benefit of both. . . . It is an essential part of the system proposed for opening up this vast and roadless country, that every portion of the work done should form a component part of a perfect whole, and that whatever expenditure is made, whether it be one thousand or one hundred thousand pounds, should be laid out in the right place in accordance with a thoroughly

digested and well matured plan; the great object in view being to obtain the greatest economic result from the outlay of money and labour.

"I can scarcely hope that the plan of gradual development herein advocated will satisfy the precipitate or the impatient,—those, in fact, who would urge the immediate construction of the railway, regardless or ignorant of the cost and the burdens it might in consequence entail upon the country—yet there are many who, remembering the tortoise in the fable, will perceive that a slow yet certain movement will accomplish the desired end with as much certainty and perhaps more satisfactorily than if the work was undertaken with the most sanguine hopes of speedy achievement. The line of artificial highway proposed to be constructed extends over not less than forty-five degrees of longitude, equal to one-eighth of the length of a circle of latitude passing entirely around the globe; the undertaking, therefore, is one of no ordinary magnitude, and when in connection with it, half a continent has to be redeemed in part at least, from a state of wild nature, some considerable length of time must necessarily be occupied in the process. Even if it should take a quarter of a century, which after all is but a brief period in the history of a country, it would be equal to an average construction of fully 100 miles of railway a year, and possibly the annual introduction of 100,000 emigrants.

"Were such a scheme as that proposed once adopted, and a comparatively small sum expended on the construction of a simple, even a rude, waggon road, and on the erection of an electric telegraph on the best railway line within British territory, there would be no fear, it is confidently believed, of the final result. The rude waggon road would be more than the embryo of a railway from ocean to ocean, it would be the rudimentary spinal column of a country covering no less than sixty degrees of longitude, and which, in the providence of events, may become an important power on this continent,—while the telegraph would at once resemble the spinal cord of a national nervous system which must yet ramify in many directions throughout this great division of the Colonial Empire."

Since these views were first held the circumstances have materially changed. Apart from the political and special considerations which enter into the discussion, we have acquired more accurate geographical and general information; and it would now appear that the habitable territory is considerably more extensive than was at one time supposed. In consequence, a much more comprehensive railway and road system would seem to be required and ought to be projected. Instead of a single line of railway through the fertile belt, at least two trunk lines, with cross connections and numerous branches, may ultimately be needed to serve the greater breadth of country. This does not, however, render it less important to regard the economical principles which ought to regulate the establishment of all the highways of the territory. The interior of Canada has, without any doubt whatever, a vast area of fertile soil; yet it cannot be denied that there are many

drawbacks to contend with. Some hold that the climate, especially the winter season, is one. Its great distance inland is undoubtedly another, and perhaps the most serious, and this circumstance makes it the more imperative that, to afford the fullest opportunity to successful colonisation, the lines of communication should be established on sound principles. The principles of the territorial road system, to which I have referred, appear to me so fundamental as to make them quite as applicable to-day as when they were first promulgated. The map which I have prepared shows the possible position of the leading railway lines, which, based on the information we have recently acquired, may be projected for the future services of the country. In the west, lines are shown to reach the Pacific tide water at Port Simpson, at Burrard, Bute Island, and Inlet, with an extension to Vancouver Island, running to Esquimalt, Alberni, Fort Rupert, and Quatsino. In the interior, the Bear River, Saskatchewan, Athabasca, Peace River, Lac La Biche, Swan River, Assiniboine, and Red River districts are proposed to be served by main lines or branches; while to the east lines are carried to York Factory, James's Bay, Lakes Superior, Ottawa, and a point below Quebec. Of course this is a mere projection, and it is presented to illustrate the comprehensive view which, in my opinion, should be taken of the question. All these lines, or modifications of them, I consider eligible for territorial roads; not that they should be all at once built, or even all at once surveyed, but simply to complete the scheme of great thoroughfares which in course of time may be established and used. They may at once be designated territorial road lines, and when they come to be surveyed they should be laid out with great care and forecast, having in view the most perfect line ultimately; a territorial road being understood to mean simply a railway in an incipient stage, capable of being used as a means of intercourse at all stages, its highest condition of development being a steam communication.

It may be assumed to be the desire of the Government and people of the Dominion that the great undeveloped interior of Canada should be colonised in the most successful manner possible. It could not be held to be successfully colonised unless peopled by inhabitants like themselves, hardy, self-reliant, vigorous, and determined; or unless the many thousand miles of railway required were constructed in such a way as to leave them when finished in a condition to do their work efficiently and without loss. This certainly would not be the case if, through too hasty and ill-considered construction, or through any other cause, liberal Government grants, as well as private resources, were swallowed

up, and the lines left burdened with debt which no future traffic could support or remove.

The system which I have referred to is one of evolution, and the highways would necessarily be of slow growth; the system is, nevertheless, in my judgment, one which could not fail to succeed. It is, however, purely a colonisation scheme. I am prepared to admit that there are many weighty reasons why some one of the lines projected across the continent should be pushed to completion more rapidly than colonisation purposes actually demand. I have already mentioned that the enterprise known as the Canadian Pacific Railway has been designed for a purpose beyond that of settling the vast interior of the country. One of the objects is to unite the Pacific and Atlantic coasts with a continuous line of railway without passing over foreign sea or soil.

How can I very briefly?—for I fear I have exhausted your patience—how can I in fewest words set forth the immense importance to the Empire of having a line through Canada in operation as speedily as possible?

Esquimaux, the naval station on the Pacific, and possibly the great Pacific arsenal of the future, is some four months' steaming distance from England. I venture to state that by the projected Canadian lines it would be possible to carry despatches from London to this station on the Pacific in thirteen or fourteen days, and that New Zealand could be reached in less time than it has ever yet, as far as I have learned, been reached.

The great Australian provinces must surely be interested! A railway across America on British soil must be of some moment to every British station in the North and South Pacific Oceans. It would open up a new route to India! There would probably be less nervousness felt from day to day, and from month to month, here, in the heart of the Empire, about the Eastern Question if we had an overland route through Canada. And in this view the consideration of a very simple yet important Western Question might in some degree diminish the interest felt in a very serious and complicated Eastern Question.

If it be admitted that the speedy completion of a railway across Canada is of general importance to the Colonial Empire, the question arises, Which line could be most speedily constructed, and, when established, would best subserve Imperial interests? This is the important question for present consideration and decision; as far as the colonisation of the vacant parts of Canada is concerned, it is of no great consequence which of the lines ultimately required be first completed.

The resources of Canada are perfectly competent, in some such manner as that I have described, to establish all the highways wanted for opening up the country, but it would occupy many years to effect this in a satisfactory manner. If other and higher than local interests demand a through line of railway sooner than it is locally required, it seems a reasonable suggestion that those higher interests should in some way or other assist in obtaining it. As a member of the great Colonial family, Canada very largely participates in the higher interest, and as such it cannot be doubted that she is perfectly prepared to bear her full share of the cost of establishing the communications of the Empire.

My Lord Duke, ladies, and gentlemen,—I must beg your permission, before this passes out of my hands, to offer a personal explanation and apology. When first I was paid the compliment of being asked to read a paper on Canada, I felt I should best serve the Institute by declining, and thus leaving an opening for someone else more competent to do it. Subsequently the Council was good enough to urge me to undertake the duty. I should have been glad had it fallen into worthier hands, as I feel that I have been unable to do the subject I have endeavoured to bring before you anything like justice. To make matters worse, a day or two ago, when preparing my paper, I received a cable message from the Canadian Government, urgently requiring me to leave by the first steamer. As a consequence I have been much hurried. I am conscious that my paper is ill-prepared, and as I sail in twenty-four hours, before these lines can be read to you I shall, all being well, be approaching mid-Atlantic and speeding as fast as steam can take me to that country I have attempted, though imperfectly, to describe. You will probably think this a happy interruption by cutting short my remarks. I confess I have found the subject much too large for the limits of one paper. There are many points I should have wished to have touched upon. I have not even mentioned that the construction of the Pacific Railway has already made considerable progress, that the locomotive is now to be heard snorting north of Lake Superior, that the steam whistle is screaming on the shores of Lake Winnipeg, and that the telegraph, the pioneer of the railway, has advanced so far that you may send a message from almost any street corner in London to Edmonton, near the base of the Rocky Mountains. I should especially have desired to have made you better acquainted with the four millions of Canadians with whom I have intermingled for nearly a lifetime, and told you, if you need any assurance on that point, about their devotion to the old flag, their attachment to the Empire, and to the Queen. Canadians

glory in their connection with the little island across the water, they are proud of the progress they have made, and they may be pardoned for measuring their progress by comparisons. True, they may be considered an agricultural people, yet their outside trade is not trifling. They witness their shipping on the high seas with a tonnage greater than Germany, double that of Spain, and nearly three times that of Russia. If with a small section, a mere corner of Canada sparsely populated, they have already a shipping trade which makes them almost the third maritime country in the world, what may they not hope for in another half century? It cannot be doubted that Canada possesses the elements of a great future, and that in a comparatively few years she may add incalculable strength to the British Empire. Canadians cannot strictly be called Englishmen, but they are proud to be British subjects, and they are by no means unwilling to join in the trials and struggles of the mother-country. They share in the advantages of British connection, and they would feel themselves unworthy of their name did they shrink from bearing their fair share of the burden and responsibility of consolidating and maintaining the prestige and power of the Empire.

DISCUSSION.

Captain FRENCH, R.A., C.M.G. (late Commissioner North-West Mounted Police, Canada), said : The few remarks I have to make refer more particularly to the north-west territory and the province of Manitoba, with which I am acquainted. I thought it would, therefore, not be out of place my appearing here and saying a few words, especially as it is not a country generally known to the inhabitants of the British Isles. I can quite go with all that has been said in that paper with respect to the great fertility of Manitoba and the portion of the north-west territory immediately adjoining it. In 1874 I followed the line just north of the boundary line from Manitoba to the Rocky Mountains, about 800 miles. At that time I had command of a considerable force of mounted police, who were pioneers of law and order in that country. They proceeded from the province of Manitoba, which his Grace has pointed out, and you see what a particularly small place that is on the map, yet it extends through 8° longitude. After you leave the Red River for forty miles along the boundary line the country is excellent, and, like all the Red River valley, it is rich alluvial soil—in fact, the whole province is supposed to have been in ancient times the bed of a great lake. After passing the Pembina River

forty miles out, you get into a less fertile soil. I cannot go with the statement that *that* great blank space *there* (explaining on map) is land of any considerable value at all. I mean north of the boundary, the great coteau of the Missouri, it is a perfect blank on the map, and it is not worth much. That country has been very little surveyed or passed over by anybody. We have travelled in considerable force over those parts with 300 men, as many horses, and about 150 oxen, requiring considerable forage, and having great difficulty in obtaining any. After you get 260 miles out on this line from the Red River, there is no wood whatever. It may be a pastoral country, but it would trouble the people to find wood for fuel or building. Our horses and cattle died there for want of food, and I should not advise anyone to go there on a pastoral expedition. Near the Qu'Appelle river, and thence north to the Beaver Hills and Touchwood Hills, is a beautiful country. hold that you cannot in Her Majesty's dominions get such a quantity of good land within so small a compass as within the province of Manitoba, for 100 miles west of it the land is really excellent. As you approach the north Saskatchewan, there is plenty of good land and timber. The isothermal lines run north an extraordinary distance as you approach the Peace River. I am satisfied that far north, near the Rocky Mountains, wheat and other grains can be grown. The Canadian Pacific Railway has been altered from what you see on that map (south of Lake Manitoba), but unfortunately not for the better. Mr. Fleming in his remarks says that a "great railway route like this ought to be 'exhaustively surveyed' before the roads are made." I should like to read a remark out of the report laid by Mr. Fleming before the Government this last spring. It is from one of his surveyors. At page 199 of this report it says: "It was found that the Nut Hill lies to the *south* instead of to the *north* of the Assiniboine; it extends for several miles in a north-west and south-east direction *across the line of railway.*" It would appear to me that as they were then putting up a telegraph line on the *located line* of the Canadian Pacific Railway, it was a little late to find out that the Nut Hill was *south* instead of *north* of the railway. This does not look like an "exhaustive survey." As far as I know, the location of the Canadian Pacific Railway was very suddenly and hastily changed, and I regret to say it was not changed for the better. In the province of Manitoba I should imagine that you have reached about the northern limit of the growth of wheat. In that longitude, when you get up to that upper section, past the Swan River, in latitude 52°, and fully 150 miles more north than Winnipeg, you not only get more to the

north, but you get some 800 to 900 feet higher up, which height above means a considerable difference in temperature all the year round. I should like to tell you a few facts about the Swan River section. From observations taken with instruments supplied from the Observatory of Toronto, it was plainly demonstrated that the temperature fell below freezing-point *every month of the year*. During the year 1875-76 the minimum thermometer registered 80° below zero, or *lower* for eight consecutive days in January, 1876, three of the other readings being 43°, 45°, and 47° below zero. I do not regard that as anything particular, because in the winter it does not much matter, but when we have frost *every month in the year*, it is evidently not good for agricultural produce; and so we found, I may state, that *this* section (the Swan River valley and along there) is 150 miles further north than the valley of the Assiniboine, where it passes through Manitoba; in addition to being 750 to 1,200 ft. higher, a difference in altitude that, as already stated, must represent a difference of temperature of several degrees all the year round. The early oats sown in May, 1875, at Livingstone, were killed by frost; those sown a little later were frozen in August and rendered unfit for use. Wheat grew well, but was destroyed by frost. Barley and potatoes did very well. An officer of the Hudson's Bay Company, who had been in charge of the Swan River district, informed me in writing that from the records of their posts in the vicinity of Swan river, it appeared that *wheat did not ripen once in twenty years*. This is the country to which the route of the Canadian Pacific Railway has been changed. The route projected by the Government in 1873 passed south of Lake Manitoba. The present Government have changed it to the north across Lake Manitoba, and up the Swan River district. Conversing with an officer of the Hudson's Bay Company who was thoroughly well acquainted with the country between the Red River and the Saskatchewan, he expressed the opinion "that it would be impossible to construct a line of railway between those two rivers which would pass through *as much bad land* as the located line of the Canadian Pacific Railway," an opinion in which I fully concur. This particular section (Swan River) is about 700 miles from Lake Superior—from water carriage. Livingstone is 681 miles from Lake Superior, and 916 feet above it; wheat will not ripen there. If that country will not produce wheat, what grains will it produce that will pay transports of 700 miles overland to Lake Superior? If the railroad had been kept south of Lake Manitoba and the Riding Mountain, and thence north-westwards, through the Touchwood Hills, it would pass through nine-tenths of excellent land, and all that country

will produce wheat. This line would be as short and of easier construction than the projected one. Of course, I wish it to be distinctly understood that I happened to be out there as an Imperial officer temporarily employed, and I have no particular interest one way or the other, but I think it is well when men are in entirely independent positions that they should make plain statements on matters of such general interest to the public. (Hear, hear.) I do not think anything has been mentioned about the grasshopper and mosquito, which I regard as the greatest plagues of the country. This grasshopper plague was so bad in 1874 in the southern section, where settled, that many persons left the country altogether, but at the same time I think that cultivation and turning down the sod and destroying the eggs in every way will rapidly decrease that plague. The mosquitoes, for the same reason, missing the long prairie grass which was their natural cover, will also disappear. That has been the experience of the Western States; at the present time it is a terrible plague. I do not think it is well for me to worry you with further remarks, but I should like, as Professor Macoun's name has been mentioned, to quote his remarks upon the country traversed by the Canadian Pacific Railroad to the west of Lake Manitoba. I take it from Mr. Fleming's report, page 315: "The greater part of the country between the Duck, Porcupine, and Riding Mountains on the west, and Lakes Winnipegosis and Manitoba on the east, is *very wet and marshy*. This may be said to be the cause of *summer frosts* in that region." From what I have stated, and from this official extract, it may be inferred how unsuitable for settlement is the greater portion of the land adjoining the *located* line of the Canadian Pacific Railway, between the Red River and the Saskatchewan. There are now no settlers near *that* line, though along the southern route which I have indicated it is thickly settled for the first 100 miles from Winnipeg, and numbers of farmers were taking up land in 1876 nearly 200 miles west of Winnipeg. As an independent man, I must state if the northern route is persevered in, it will be a great calamity for Canada.

Lieut.-General Sir H. LEFROY, K.C.M.G. : My lord duke, ladies, and gentlemen,—When I heard the gallant officer who has just addressed the meeting, I could not but recall sentiments very much indeed to the same effect which it fell to my lot to express, I think, at this Society several years ago, and which I know met with universal reprobation. They were not believed, and I felt myself in a somewhat uncomfortable position for venturing to say in the face of the enthusiasm which greeted the proposal for a trans-

continental railway at that time, that there would be those drawbacks which Captain French has pointed out. At the same time I am bound to say that, looking to the great length of time which has elapsed—a third of a century—since I left that country, I do not feel so qualified to express an opinion now. The progress it has made, and its promise for the future, is something which no imagination could have then conceived. (Hear, hear.) I left the territory in the year 1844, by no means in a railway carriage, but by a birch-bark canoe, which had been paddled by the same hands some 7,000 miles. A district where we could scarcely grow potatoes, and where I have seen mercury frozen as hard as a stone, has since sent magnificent wheat to the Philadelphia Exhibition. (Hear, hear.) I think we are not yet fully informed as to what influence the processes of civilisation and of cultivation may have towards improving a climate. As to that plague the grasshopper, opinions differ much as to the frequency with which it may be expected; some say it comes every thirteen, some every thirty years, and some even as often as every third. It comes too often, at any rate, for the husbandman; it may, however, very possibly give way before the processes of agriculture. I believe that if the settlement of the country is only advanced in the spirit of prudence and modesty, and moderation, which I may be permitted to say has characterised Mr. S. Fleming's paper, which I have listened to with great interest, there is a splendid future for those regions. Mr. Fleming has carefully avoided drawing a too highly-coloured picture, and, having known him for thirty years, I must say that there is no man on whom I place more reliance and confidence for sound judgment. Misrepresentations respecting that region have not come from him, but from speculators, who seldom face the hardships to which they invite other people, and who have endeavoured to attract into it industry from this country which might have been much better attracted to other quarters. Let the process of settlement be gradual, let those go there who are prepared by their birth and antecedents for the life of a backwoodsman, and before long we may hope to see teeming thousands all over the place; but do not force it. You may take over the Icelanders and Mennonites in any numbers; to them it cannot but be gain. The population taken there fifty or sixty years ago were Orkneymen and Highlanders of Scotland, used to the same description of life, and they soon found a home; but it is a different thing when we come to take over agricultural labourers from our own districts to—I was going to say to the inhospitable, but that is hardly the term to use—to this severe and trying climate. If Mr. Fleming's

"Territorial Roads" scheme can be carried out by the Dominion Government, if they will be content to walk before they essay to run, I really believe there is scarcely any limit to what we may hope to see realised. Let me call attention to the figures mentioned by Mr. Fleming. He spoke, I think, of one hundred and sixty millions of acres of land supposed to be more or less capable of grazing and cultivation. Now, it is impossible for the mind to conceive what one hundred and sixty million acres are. But let me put it to you in this way. Suppose the country marked out like a chess-board, in squares of a mile each way; it would take a quarter of a million of men to put one upon every square. Such is the verge and space which is offered in that region for settlement. If settlers prepared by their antecedents to find happiness in it can be attracted there, Divine Providence has given to the English race a magnificent inheritance in this land. It is our duty and our destiny to occupy it, and I do not suppose that any permanent obstacle stands in the way; but gigantic undertakings, which so often become gigantic failures, are not the surest path to success. Time, however, may have great destinies in store for what is now a wilderness. I hope it, and I firmly believe it. (Applause.)

Sir BRYAN ROBINSON (late Judge of the Supreme Court of Newfoundland): I have heard with much pleasure that interesting paper—that epitome of Canadian life, character, and resources which has been read by the Hon. Secretary, and I may add, so well read. The learned engineer, whose absence we deplore, has laid the whole of British North America under a debt of gratitude, not merely for the labours he has undergone, but for the record of them he has embodied in the valuable paper which he has left behind him. (Hear, hear.) When I heard the gallant officer who first spoke differing in details from Mr. Fleming, and professing to support his views by statistics, I was reminded of an observation made by the late Mr. Canning, that with the exception of "facts nothing was more calculated to mislead than statistics." Now, it is always well to hear two sides of the story; nevertheless, in spite of all that has been said by the gallant captain, I do believe that wheat *will* grow in Canada, and I do firmly believe that Canada has within its womb the germs of a great nation; for a great nation it cannot fail to be, with its enormous territorial extent, its capability of producing the necessaries of life in such boundless quantities, with its healthy climate and its Anglo-Saxon population, with British institutions and a love of liberty; it must, with such advantages, go ahead. It has been supposed that Canada has

not kept pace proportionately with her great sister, the United States. If I were not afraid of referring to statistics, I would venture to say that it can be proved beyond doubt that Canada has not only kept pace with, but has surpassed in her development the advance of the United States, and that it is destined to afford a home to British subjects, who will not better their lot by joining their Republican neighbours. I am sorry that Mr. Fleming is not here to-night to hear the remarks that have been made by Sir Henry Lefroy and others on a country in which he has spent the greater portion of his life, and which has been the object of his industry and ability. (Hear, hear.) We who live at home at ease cannot readily estimate the hardships which a surveyor has undergone who has explored the wilds of Canada and of Newfoundland. (Hear, hear.) Most of his journeys, especially his earlier ones, were made in summer, and the sufferings to be endured at that season by reason of heat and mosquitoes are not to be lightly regarded. It has been said that if the spirit of the Evil One were allowed to be incarnated for the punishment of our sins, he could not assume a body more effective than that of a North American mosquito. (Laughter.) It is throughout these summer months, when the heat is almost tropical and mosquitoes awful, that these explorations have been made by Mr. Fleming and his associates. The only portion of British North America that is not included in the Dominion of Canada is Newfoundland. Opinions in that Colony differ as to the expediency of joining Canada, and good reasons can be urged on both sides. My own opinion is that in unity is strength, and that it would be wise of Newfoundland to unite herself upon proper terms. There are two opinions upon what terms are reasonable, and I have no doubt that when the Statesmen of Canada and of Newfoundland shall dispassionately consider the question, a satisfactory solution will be reached. The large island of Newfoundland stands between England and America nearly midway; it is as large as Great Britain, it abounds in excellent harbours, it occupies a position which gives it the key of the St. Lawrence; its waters teem with fish, its land with minerals; it possesses a hardy and loyal population, which is just what the Canadians as a nation would want to man their fleet. When they shall have become one of the Powers of the world, nature prescribes Newfoundland to be the necessary complement of Canada, and the wisdom of Canadian legislation would be to offer such terms to that Colony as would bring the two together. The sooner that conjuncture takes place the better. The sense of the country has always been in favour of it upon adequate terms, and

the union will not much longer be delayed when the interests of both countries shall demand confederation. The paper just read will help forward such an union, and I only regret that the author was not present to lend the attractions of a *viva voce* delivery to the intrinsic merits of his history. (Cheers.)

Dr. RAE : I can say only a very few words on the subject which has been so well and so eloquently described in Mr. Sandford Fleming's paper. I think it one of the clearest and most modest descriptions I have ever heard, for there is nothing beyond a plain statement of facts. There is some difference of opinion as to the action of frost on the crops in that large tract of country, but I may tell you that far to the north, on the Mackenzie river, fully 700 miles beyond or north of the line marked out for the Canada Pacific Railway, barley and potatoes almost always ripen well, and would be less affected by frost if the woods were cleared away to a greater distance, which the Hudson's Bay Company's people have no time to do, and clear no more ground than sufficient for their own use. At Fort Liand, 550 miles north of the railway route, barley and potatoes, with many other vegetables, grow well, and wheat also generally ripens. Cultivation and drainage also help to get rid of those fearful tormentors the mosquitoes, whose powers of annoyance a gentleman has just now so well described. Close to the Arctic circle I have seen them so numerous that they made a noise like the swarming of bees ; we could not eat our food without swallowing some of them, and the reindeer rushed into the water, and to protect themselves left nothing but their noses above the surface. I have known them to make a very good Wesleyan clergyman almost swear—(laughter)—which I thought a sure sign of the very acme of suffering, a sort of martyrdom, in fact. This worthy man used to tell me that mosquitoes were sent as a punishment for our sins, on which I said it was curious that they annoyed him, one of the "unco" good, more than they did a poor sinner like myself. Mr. Fleming has alluded to the dangerous rapids of the Fraser River. After crossing the Rocky Mountains in command of a telegraph survey through the pass chosen for the Pacific Railway—the latitude of which I corrected to the extent of twelve or thirteen miles, and found the altitude very nearly the same as afterwards more minutely measured by the surveyors—I descended the Fraser in small dug-out canoes about eighteen inches wide. When my men learnt that the usual Indian guides could not go with us, those who had been engaged to accompany me refused to go, and I had to be beat up for recruits, threatening to go myself if no one would volunteer ; fortunately two smart young fellows did, and we ran all

the bad rapids as far as Fort Alexander. Some of these were long and very dangerous, so much so, that at one of them, where we met an Indian and his wife, the latter was in an agony of fear although her husband *only* was to run the rapid, she remaining on shore. It was curious and exciting to see the men in the leading little dug-out, sitting, as it were, in the turmoil of waters (for the canoe was not visible), as we (my man and myself) followed close in their wake. There was a charm in the whole thing that was very pleasurable. The people at the forts we arrived at were surprised at our having got down in safety without guides, and in such small craft. Our little half-breed leader, Kenny McKenzie, was a cool and practised canoeman, and guided us sometimes with consummate skill and nerve within a very few feet of almost certain death. I may add that all along the north bank of the north branch of the Saskatchewan, the soil is very rich, and we were riding through vetches or wild peas up to our horses' knees a great part of the way. On the whole I agree very fully with Mr. Fleming's favourable report of the country, and believe that the chief drawbacks, namely, grasshoppers, mosquitoes, and frosts, will become ameliorated by colonisation and cultivation.

Mr. HADDAN: I believe this railway across the Pacific to the Atlantic Ocean is obliged to be made, because its construction forms one of the conditions by which British Columbia was joined to the Canadian confederation. A railway of some sort must be made somehow. Both the author and Captain French have told you that even the districts to be traversed by it are not surveyed yet, and that the country is of the roughest, and in many places uncultivable. I fancy, therefore, it will be difficult to get persons to invest in such a speculation, especially as not a week since Mr. Fawcett, M.P., demonstrated, that even Indian State railways had not returned one per cent. interest on the capital expended. The picture on the wall represents a view of the Pioneer, or one-legged railway, a structure which, as you perceive, is made entirely of timber, and possesses no earthworks or masonry of any description. It requires 4,500 cubic feet of timber per mile, and its cost would not exceed £600 complete, while in twenty months the whole line, from ocean to ocean, could be constructed, and it can easily be constructed by 200 men at the rate of two miles daily. Railways, as we understand them, are permanent structures, and therefore not suitable for a tentative line like the Inter-oceanic Railway, for an earthwork railway once made cannot be altered. Nor can a narrow gauge be turned into a broad gauge, nor, as suggested by the author, can territorial roads be constructed

with the view to their conversion into railways later on, since carriage roads take a much more direct route than railways can possibly follow, and, what is more, cost more to keep in order. The Pioneer, or steam caravan, has but one rail elevated on stout posts at about three feet above the ground, the carriage or panniers ride astride it and do not touch the ground, which is therefore left intact. Nature resents earthworks of every description, therefore the Pioneer avoids them altogether,—no small advantage in a country where labour is wanted for better things. People laugh at its appearance because they are not accustomed to it, but what can be more calculated to provoke derision than our system of railways, where to obtain a few inches of level road to run upon (about ten inches for a double line) engineers deem it a *sine qua non* that forty or fifty feet of earthwork should be levelled. The Pioneer uses one rail to run upon, and does not level the ground at all. Which, therefore, is the most sensible? Again, our engines demand weight as pulling power, and the steeper the line the heavier the engine our engineers require. On the Crystal Palace Line of the Chatham and Dover Railway, a purely passenger line, the engines actually weigh fifty tons, and the rails and bridges of course have to be made to support this leviathan. The Pioneer engine abolishes the necessity of using weights for obtaining pulling power, the engine being fitted with horizontal wheels, which grip the side of the fence-like structure. Thus it can climb a mountain side, and go as the crow flies, taking behind it a train of 100 tons, while on such grades an ordinary train would have become all engine. Mr. Fleming insists, very properly, on cheap working expenses as meaning more than cheap first cost, and it is by avoiding weight that the Pioneer can carry goods at about half the cost of an ordinary railway. While resident in Turkey some ten years, I had daily the problem to solve of how to make a railway in no time, without any money to speak of, and still everything to be strong and substantial; and it was this training which has enabled me to come down from our high estate of saloon carriages and Pullman cars, to devise a system of steam caravan suited to the pockets of poor and vast continents who, in the usual course of events, might never see a railway at all. Surely in such countries it is not at all profitable to spend the time of men in cutting off the tops of mountains and filling the valleys with them, especially as the worse the mountains are, the fewer the inhabitants available to perform the operation. It is surely absurd to propose such unnecessary work in Canada, or to employ cattle for dragging carts over roads which cannot be kept in order, since Mr. Fleming states there are

but 30,000 settlers along the whole line of 1,500 miles. Machines are invented by the score to save some details of labour, but the Pioneer saves man and beast the drudgery of portage, and sets them free to develop Canada into a granary for the mother-country.

Mr. CORNELIUS WALFORD: I have been disappointed in the course the discussion has taken this evening. I thought with regard to the development of the resources of Canada we should be told more about what could be done than what could not be done. I take it that in a country like Canada you have to look, not to the grain-growing property of the soil, where there are no inhabitants to consume the cereals grown, but rather to the natural products of the soil; and there seems to me only two modes in which the Canadian Pacific Railway can be materially helped forward. The first would be by the development of the mineral products on the Pacific side—and here I may say that I am familiar with the mining districts of California, and there is no doubt that the Union Pacific Railway of the United States could not have been rendered a paying enterprise, and would never have been made in our time, but for the mineral resources which California has opened up. We know that if the Canadian Pacific Railway is ever to be made with due regard to profits, it must be from the development and working of the mineral products of British Columbia; and I take it that in a few years sufficient could be done in this respect, assuming proper facilities on the part of the Government, to raise the population in those districts. And if the railways are made there at all it must be with due regard to profit. But to make a railway through that desolate country—through 1,500 or 1,800 miles of country in which it would be almost impossible to get people to settle—is a hopeless and futile task. There is one way in which some of the valleys might be utilised in the north-east, and that is by producing cattle for the English market. Already a large amount of live stock is being sent to this country from Eastern Canada, and it falls entirely within the objects of this meeting—which is to develop the resources of Canada—to consider whether this proposal be a practical one. I say then, in regard to cattle supply, that there is an opening at once; and if those vast plains could be utilised for that purpose, there would be the direct advantage in making a railway to bring the cattle down to the east ports, and in the meantime a population would be growing. It is a population, and the supplying the wants of such population, and the development of these natural resources of the country by making its products available for the world at large, that alone can make a railway such as this at once a necessity and a commercial success. I say with the cattle trade on

one side, and the mineral wealth on the other, we should see substantial reasons for making this railway, the dream of Canada, and it must be realised before Canada can be the country we hope to see it. (Hear, hear.)

Captain J. C. R. COLOMB, R.M.A. : With regard to the wheat and the animal products of Canada, I think it might be useful to notice some considerations. We have heard a good deal about the local interests of Canada with respect to these ; we have heard of the vast plains capable in one way or the other of great development and their influence upon the many millions of people that can be accommodated there in the future. I would wish to draw attention to the state of affairs as they appear to me to affect the United Kingdom at the present time. Any question that turns upon the production of wheat, or of the means of human sustenance, must be one of importance to every inhabitant of these islands. I will give one fact which may bring this more vividly before you. In the seven years ending in 1840, the total foreign importation of wheat into this country was six million quarters. If you take seven years ending 1877, you will find that we required 370,000,000, quarters : you will see that by the last statistical return, which has been a very remarkable document, brought out last month and furnished to the Government of Washington. If we come to Canada alone, we find that in 1873 the total value of wheat she gave us from all sources and kinds of exports was \$38,700,000. If you analyse the articles supplied by the Dominion, you find that more than one-half were articles of food necessary for the people of this country. There were the produce of the fisheries and the animals and agricultural products. And if you take the year 1877, you will find it very much the same, and observe a remarkable increase in the quantity of animal produce introduced into this country. Therefore, I think, that this Pacific Railway, and everything that concerns the development of that region, putting aside all other questions, is surely a matter that does vitally concern not only Canada, but the people of this country. (Hear, hear.) I was much struck on reading in the papers the other day a letter from Sir Samuel Baker. I am not going to trespass upon political or military grounds with reference to the present crisis ; it drew attention to the important fact of the dependence of this country for its grain. What Sir Samuel called the natural granaries of the earth he represented to be chiefly in the neighbourhood of the Danube and in the United States ; and, having shown the great necessity of keeping open our means of communication with such places, he pointed out that in certain events we should be in great

difficulties with regard to our food. The point I want to bring out to you is, what was the alternative? It was not to look to our own dominions, it was not to draw attention to the fertile lands waiting for cultivation by English hands, but the alternative proposition to get us out of our difficulties was that we should persuade Egypt to grow wheat. I think it would be advantageous if this Institute would look into these questions, and consider a little more what are our own necessities in these islands, coupled with the fact that, with a rapidly increasing population, there are 800,000 acres less under cultivation in England now than there were twenty years ago. The population is increasing, and it is well to bear in mind that, taking the inhabitants of these islands at 88,000,000, 15,000,000 in these islands are wholly and solely dependent for their food upon what we can get across the sea. If we are to be self-reliant and self-supporting, it does appear to me that the development of the lands in our hands is a question not concerning a particular district, but the Empire, and particularly the people of this kingdom. (Applause.)

The PRESIDENT, in summing up the proceedings, said: I should like to remark upon what Captain French said. I have no doubt he spoke sincerely and truly in what he observed, but I should hope that he was not fortunate in the season in which he made those observations, because I agree with Sir Henry Lefroy that Mr. Sandford Fleming's character and manner impress one most strongly with the conviction of the truth of what he says and the soundness of his opinions. (Hear, hear.) He has been very cautious, I should say, in the statement he has made, and I should think he never made a statement without being justified in making it, and that he did so without any exaggeration whatever. (Hear, hear.) You will have noticed, probably, in the paper read—and he has mentioned the facts with perhaps greater detail in "Ocean to Ocean," a book describing his journeys across the Continent, and I am quite sure that he has good and sufficient grounds for what he has stated—in speaking of the country which he travelled over, between Lake Superior and the Rocky Mountains, he said there were 800 million acres of land, about 150 millions of which were profitable for farming, tillage, or grazing. Of that, 80 millions was fit for tillage; and he remarks that 47 million acres is the extent of the United Kingdom, including water and land of all sorts—47 million acres being very little more than half of what is supposed to be fit for tillage in this district. As to the climate, I think from what I have heard of it—I have not experienced a Canadian winter, but I have always heard from everybody who

has been there that individuals do not suffer from cold—that the crops in most parts of it do not suffer, as the seasons are very regular. The snow forms a sort of blanket to the earth; it melts from the heat of the sun, which is very strong, in a comparatively short time, and vegetation is remarkably rapid when the spring sets in. I hope it will prove to be so. Dr. Rae has told us to hope that it would be so in most parts of the country in that district to which allusion has been made. In conclusion, I think we may all feel satisfied that Mr. Sandford Fleming has favoured us with so very clever a paper, and we may congratulate the Dominion of Canada on having the services of so experienced a person and so able a man as he is. (Hear, hear.) I am quite sure that anything he recommends will be wisely recommended, and would be wisely carried out, and be for the benefit of the Dominion of Canada and of the British Empire. (Hear, hear.) I quite agree with the remarks made by some gentleman, who said this is not merely a Canadian question, but an Imperial matter, and I only wish there was the slightest hope of the Chancellor of the Exchequer being able to contribute towards the cost of a railroad for bringing grain here from those countries. I beg to move a vote of thanks to Mr. Sandford Fleming for the paper, and to Mr. Frederick Young for reading it. (Loud applause.)

Mr. FREDERICK YOUNG: On Mr. Sandford Fleming's behalf I beg to thank you sincerely for the compliment you have paid him. It will be my agreeable duty to convey your thanks to him, which I am sure he will thoroughly appreciate: It has been a matter of great regret to me that he was not here this evening to read his own paper. When I invited him, on behalf of the Institute, to undertake to give us a paper on Canada, I had no idea he would be so suddenly called away from England on public duty by the Dominion Government, but I am sure I can heartily join with those who have expressed their gratification with the paper I have had the pleasure of reading. I sincerely rejoice the Royal Colonial Institute has obtained such a valuable and important contribution to its archives from the pen of an individual so distinguished as Mr. Fleming is in connection with the Dominion.

The meeting then concluded.

TO FREDK. YOUNG, ESQ., HON. SEC. ROYAL COLONIAL INSTITUTE.

DEAR SIR,—Before I left Ottawa the other day I received a copy of *The Colonies and India*, containing a report of the discussion on a paper on Canada which I prepared before leaving England a few weeks ago, and which in my absence you were good enough to read on my behalf.

Had it been my good fortune to have been present at the meeting when my paper was discussed, I would, in all probability, have been granted the usual privilege of replying to any gentleman who spoke. My absence was unexpected and unavoidable; I trust, therefore, I may be permitted to address you, as I wish to avail myself of the earliest opportunity of clearing up some statements which were made in the discussion and with which I do not wholly agree.

The first speaker was Colonel French. His remarks, as reported, are to my mind somewhat misleading, and therefore I feel it my duty to direct attention to what he said, and endeavour to correct any erroneous impression which his statements may have conveyed. I do not wish it to be understood that I would charge that gentleman with intentionally misleading the meeting; he doubtless spoke exactly as he felt, and, having visited Canada and made a journey of considerable length through a portion of the country, he was entitled to consider himself an authority. I respectfully submit, however, that a proper judgment on the whole of Canada cannot possibly be formed on the personal observations of that gentleman alone. Colonel French's journey was mainly confined to a trip from Manitoba, along or near the United States boundary line to Belly River, returning in the same general direction to Old Woman's Lake, thence by the Touchwood Hills and Livingstone to Manitoba. If we except Manitoba and the Touchwood Hill country, respecting the fertility of both of which he speaks in favourable terms, his journey was through the barren district, along the boundary-line, and he had no opportunity whatever of seeing the vast fertile region stretching away far to the north and west of where he travelled. A foreigner visiting England for the first time, if he disembarked at Land's End, travelling through the heart of Cornwall, through the wild moors of Devonshire, and saw nothing of the lovely garden counties of the country, would form an impression far from favourable. If he attempted a description of the agricultural capabilities of the whole land and relied on his own limited observations, he would be apt to describe Great Britain as an almost barren and

inhospitable island. Has not Colonel French in some degree committed this mistake with respect to Canada?

In my brief general description I endeavoured to draw information from every available source. I alluded to a long list of authorities who at different times during the past hundred years have explored various parts of the northern portion of the continent, men whose veracity cannot be questioned, and whose united testimony establish beyond any doubt whatever the fertility of soil and generally favourable character of vast regions in the interior of Canada. In weighing the evidence for and against, we place in one scale the views of Colonel French, in the other we have the reports, descriptions, and opinions of all the travellers I have alluded to, stamped by the high authority of the Governor-General of Canada, Lord Dufferin.

Colonel French thought it incumbent upon him to condemn the location of a portion of the Canadian Pacific Railway, vide the following extracts:—

“The Canadian Pacific Railway has been altered from what you see on that map (south of Lake Manitoba), but unfortunately not for the better. . . .”

“As far as I know, the location of the Canadian Pacific Railway was very suddenly and hastily changed, and I regret to say it was not changed for the better. . . .”

“This is the country to which the route of the Canadian Pacific Railway has been changed; the route projected by the Government in 1873 passed south of Lake Manitoba. The present Government have changed it to the north, across Lake Manitoba and up the Swan River district. . . .”

“If the railroad had been kept south of Lake Manitoba and the Riding Mountains, and thence north-westwards through the Touchwood Hills, it would pass through nine-tenths of excellent land, and all that country would produce wheat. This line would be as short and of easier construction than the projected one. Of course I wish it distinctly to be understood that I happened to be out there as an Imperial officer temporarily employed, that I have no particular interest one way or the other; but I think it is well, when men are in entirely independent positions, that they should make plain statements on matters of such general interest to the public. . . .”

“As an independent man I must state that, if the northern route is persevered in, it will be a great calamity for Canada.”

Thus Colonel French went entirely beyond the scope of the subject brought before the Institute to attack the location of that

portion of the Pacific Railway lying between the Red River and the Saskatchewan River; and I am constrained, alike as the author of the paper and the chief engineer of the railway, to notice the attack. Indeed, I feel that I would be entirely wanting in my duty to the Canadian Government, to the Canadian public, to the Royal Colonial Institute, and to myself, did I allow the statements made to go unchallenged.

The work of survey began in 1871; it has been conducted by me from the beginning to the present time; no man, therefore, has had more to do with it than I have, and I do not shrink from the defence of everything that has been done under my supervision and direction. The calamity which Colonel French proclaims, if it be one, may be entirely chargeable to me, and I am perfectly willing to assume the full blame and responsibility attached to it.

In conducting the explorations and surveys, I have constantly kept in view the discovery of a line for the railway from one side of the continent to the other, which, while it passed in a generally central direction to the great bodies of fertile land, would at the same time prove the most permanently advantageous in other respects, taking into account ease of construction and the development and concentration of traffic; having also special regard to what in the near future will probably be considered the most important of all questions to the country—viz. the question of cheap transportation.

A short time after the survey was commenced circumstances called for the projection of an experimental or preliminary line. As the survey progressed from year to year, and fresh information was acquired, it was found that the preliminary line, although passing through much good land, did not fulfil all the required conditions. It was found that a much more eligible site for the railway, everything considered, was obtainable. The latter passes to the north of the preliminary line, and, being so much more favourable, it was on my recommendation adopted. It appears that Colonel French does not approve of the change, and considering himself competent to judge without knowing the reasons why the change was made—without the advantage of special information or any special qualifications for judging that I am aware of—he denounces the selected line in a most unqualified manner, and strongly advocates the preliminary line. He is altogether mistaken in supposing that the northern and better line was “suddenly and hastily adopted.” It is the result of laborious surveys, made at great cost and extending over years, and in selecting it it cannot truthfully be affirmed that every important public interest was

lightly considered. I must, however, do Colonel French the justice to state that he is not the first person who has found fault with the selection. It will be necessary for me to explain that the public land along the selected line has for the present been reserved for railway and general purposes, while the land through which the preliminary line passed has for some time been laid out for sale and settlement, and has actually been taken up by great numbers of people, either settlers or speculators. In consequence of this it will be apparent that the selected line has no one personally interested in its construction, while the preliminary line has many interested advocates. The construction of the railway near the land of each holder would greatly enhance the value of each acre, and benefit them. Those who have thus acquired land have more than once combined to defeat the adoption of the proper line, and as a final effort, they brought the matter before a committee of the Canadian Parliament. Many witnesses were examined; the question was most carefully investigated; a whole year elapsed in sifting it to the bottom. The effort was finally, however, abandoned. Every disinterested person who took trouble to trace step by step the reasons which led to the adoption of the selected route came to but one conclusion regarding it; and thus all the attacks upon the location of the line have resulted in signal failure.

The Canadian Government cannot desire to have the railway placed in the wrong position; they are most anxious that no mistakes may be made in its location, and hence the great pains taken and the large amount of money expended for a number of years back in examining the country in all directions. The staff of engineers who have been employed on the work of exploration and survey have been zealously engaged in endeavouring to meet the wishes of the Government. They have striven earnestly to discover the most eligible site for the railway that can be made in the whole country. Surely after years of labour and patient investigation these men are in possession of reliable information, and are better able to judge than other persons who can only give the subject a passing thought.

Colonel French says that he is an Imperial officer who has been temporarily employed in the country without any particular interest one way or the other, and he conveys the impression that, as an independent public-spirited man, he raises the question of the location of the railway only for public good. This is a most praiseworthy position to take, but I think it is to be regretted that he did not make himself better acquainted with the facts before committing himself so decidedly to views which are entirely wrong. I am

satisfied that any gentleman of good standing and common sense, who would take the trouble to investigate the question properly, could come to no other conclusion than that the Canadian Government have adopted the proper route, and that in the public interests it would be a serious mistake if they were to act on the opinion and gratuitous advice which Colonel French tendered at the meeting when my paper was read.

It is difficult to conceive that a high-minded Imperial officer would in the slightest degree be influenced by personal considerations in a matter involving such important public interests as the location of a highway for the Empire across a continent. On the authority of Colonel Stoughton Dennis, Surveyor-General, the officer in charge of all the lands in the interior, it would appear that Colonel French has for himself, or for members of his family, acquired several farm lots near the preliminary line,—property which would be greatly enhanced in value by the construction of the railway on the route advocated by the latter gentleman. This circumstance may not in the least influence his opinions; but it is rather unfortunate that he should have repeatedly assured the meeting that he is totally disinterested. It is still more to be regretted that a gentleman in his position should go out of his way to denounce the proper route, and make a perfectly futile attempt to have the railway constructed in the wrong position.

Colonel French charges me with making no mention of the grasshoppers and mosquitoes, which he regards as the greatest plagues of the country. With respect to this omission I may say that there were many more important matters that I should have wished to have noticed, but it was utterly impossible to allude to everything within the limits of a short paper. The subject I attempted to deal with is a very large one, and it would, indeed, require volumes to furnish details of every matter of interest connected with it.

The grasshoppers have occasionally visited a portion of Canada, but there are many districts where they have never done the slightest harm. Indeed, the greater extent of Canada has, as far as I have learnt, ever been free from any injurious results. With regard to that portion of the country, Manitoba, where the grasshoppers have at times done mischief, it is at least no worse than that portion of Europe, the magnificent soil of which has long produced vast quantities of Black Sea wheat for exportation to England.

Taking the whole of Canada into consideration, it must be borne in mind that the Dominion may be compared in size with nearly

all Europe. It would therefore be equally fair to speak of the grasshopper as being a general European plague, because it commits occasional ravages in parts of Russia, Roumania, and Austria.

With regard to mosquitoes, they are in some parts of Canada in some seasons more or less troublesome, and may be classed among the smaller difficulties which pioneer settlers must encounter. But what country is entirely free from drawbacks? I think I could mention other important divisions of the Empire, such as Australia, which have not only troublesome insects, but centipedes, poisonous snakes, and other venomous reptiles, totally unknown in Canada. In some of the United States rattlesnakes and copperheads prevail. In many of the old civilised countries mosquitoes are not the only pests; in parts of Southern Europe it is well known that scorpions, venomous adders, and tarantulas are common, and yet people live and enjoy life in Spain, France, and sunny Italy.

Colonel French alluded to the occurrence of summer frosts on the Porcupine Duck, and Riding Mountains. There never has been the slightest attempt to conceal this or any other drawback. The summer frosts are referred to in my report of last year, page 315. Parts of all countries are subject to climatic peculiarities. If the farmers of the British Isles were appealed to, I am sure even they could support me in this statement. It cannot be forgotten that only last season the crops in some of the most highly cultivated counties in Scotland almost rotted in the ground, it having rained every day for some six or seven weeks. I myself saw late in November, in the rich county of Fife, unharvested grain, with some inches of snow on the ground.

I have now, I think, dealt with every point raised, and I may be permitted to say in conclusion, that in viewing Canada as a future home for millions, we must not look only at the drawbacks, far less should we unfairly exaggerate them. The advantages which the country possesses should also be considered and a balance struck. There is an immense breadth of fertile land to be occupied before any of the less-favoured regions need be thought of. The mosquitoes that exist in some sections will, I fear, have to be endured for some time to come, but they may not seriously retard settlement. We have much to contend with in a new country without magnifying small insects into undue importance. The man who lacks courage to do battle against a mosquito had better allow others to precede him. We require pioneers of sterner stuff in Canada. A few generations hence, when millions of hardy

human beings have taken the place of herds of buffalo and bands of beaver, when mosquitoes may almost be forgotten, then the tender and the timid may follow. For the present, only courageous and vigorous men and women of any race or creed are invited to Canada. They are invited to lay the foundations of her strength, to mould her future greatness, and enable her to extend and perpetuate British institutions on a portion of the northern temperate zone scarcely inferior in size to the continent of Europe. For some time to come those who emigrate to Canada must make up their minds to think little of minor difficulties, and to work with all their might in whatever sphere of life they may occupy. There is no place at present for the idle or the effeminate.

In concluding these too lengthy remarks, I desire to express my deep regret that I was not present during the discussion on my paper. I should have wished to have promptly met the statements that were made, and to which I have now referred. While I doubt the propriety of the course taken by one Imperial officer on that occasion, it must not be thought that I object in the slightest to any person giving free expression to his mind. I feel that the more the subject I so imperfectly submitted to the Institute is discussed, the better it will be for general, as well as for Canadian, interests. Speaking for Her Majesty's subjects beyond the sea, and more especially for Canadians, the view is held that the British Empire is as little limited to the British Islands as British influence is limited to the British Empire. The Empire is fast spreading in population and in power in every quarter of the globe; long before the great American division of it becomes fully developed, and every acre of its fertile soil be tilled like the fields of England, the strength of Canada will be felt and appreciated. Canadians are fully alive to the fact that they live under the freest and best system of government on the face of the earth; they feel that they have a rich inheritance; and they look forward to the period when Canada will be considered scarcely less indispensable to the whole fabric of the British Empire than the small, yet vastly important, group of islands of which this marvellous city forms the social and political centre.

I have the honour to be, &c.,

SANDFORD FLEMMING.

16, *Durham Villas, Kensington, London, W.*

June 8th, 1878.

